

THE MADRAS AGRICULTURAL JOURNAL

Vol. XL

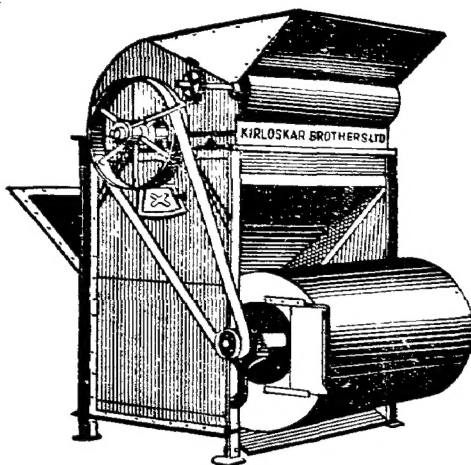
AUGUST 1953

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TO LET

The Madras Agricultural Journal

Vol. XL

August 1953

No. 8

Editorial

The Thirty-sixth College Day and Conference: The thirty-sixth College Day and Conference commenced on 17—8—1953 and continued for four days. Dr. T. S. Venkataraman of Sugarcane reputation presided over the function. Dr. Punjabrao S. Deshmukh, Union Minister for Agriculture, inaugurated the conference. Dr. R. Nagan Gowda, State Minister for Agriculture, welcomed the Union Minister for Agriculture, Dr. T. S. Venkataraman and others in a very thought-provoking speech.

The inaugural address delivered by Dr. Deshmukh gave fresh thoughts and long-desired hopes to the Research Workers of the Department to the effect that their interests will be well protected by the Union Government. He made it very clear that the technical education should be recognised and amply honoured. In this connection he pleaded very earnestly that the philanthropic rich gentlemen of Coimbatore should make Coimbatore a technical University centre as it affords plentiful scope in all branches of science.

The presidential address, delivered by Dr. T. S. Venkataraman, has given a realm of thought to Government as to how best the entire machinery of administration can be given an agricultural background. His address was of very high order and it really spurred the thoughts of one all assembled in the hall as to how best he or she should contribute to the agricultural prosperity of the state.

The symposium on 'Agricultural Department and its contribution to the Agricultural prosperity of the Madras State' was opened by Sri M. S. Sivaraman, I. C. S., Director of Agriculture and he gave the audience a bird's eye view of the noteworthy achievements of various sections in the department and also what it can do further if the necessary facilities are afforded. The various contributions to the symposium were of very high standard.

The opportunity was availed to celebrate the "Farmers' Day" in the Central Farm, Coimbatore. Both the Ministers of Agriculture, Centre and State, participated in the celebrations.

The enlightened ryots, who attended the function, expressed their views regarding the working of the Madras Agricultural Department.

Seventy officers working in the districts attended the conference. During their stay at Coimbatore they had an opportunity to attend the 'Third Conference of the Scientific Workers of the Department' and also the 'Departmental Officers' Conference.' In the latter they were able to discuss about their practical difficulties in implementing some of the recommendations of the Department by way of distribution of filter points, formulation of recommendations on the agronomic side of agriculture, seed distribution, etc. Further, these delegates had scope to go round the Section Exhibition and have discussions on their doubtful points with the concerned Specialists.

The students of the Agricultural College had their share in these happy celebrations. They gave pleasant and enjoyable entertainment to the Delegates of the Conference. In addition, they had their sports, in which they acquitted themselves very creditably.

As usual, the members of the Madras Agricultural Upper Subordinates' Association had their annual gathering to strengthen their combined efforts to further their prospects.

The sum up, it should be recorded that both the officers and the students of the Agricultural College and Research Institute, Coimbatore and the officers of the Department working in the districts were able to meet one another and exchange their views on the working of the Madras Agricultural Department. It needs no mention that such gatherings will really go a long way to step up the already high standard of efficiency of the department. The only request that is submitted to the authorities concerned is to kindly revive the previous practice of deputing the non-gazetted officers of the department working in the Agricultural Research Stations and districts for the conference. Finally, it is fervently hoped that the impending division of the Madras State will not in any way impair the solidarity and utility of the Madras Agricultural Students' Union.

May the Union grow from strength to strength to gladden the heart of every tiller of the soil!

A Short Note on the Hairy Caterpillar Pest on Cardamom and its Control

By

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Cardamom is subject to attack by thrips (*Taeniothrips cardamomi*), shoot borer (*Dichocrocis punctiferalis*), root borer (*Hilarographa caminodes*), rhizome borer (*Prodiocetes haematicus*) and hairy caterpillar (*Eupterote* sp). Of these the hairy caterpillar has a rank next in importance to thrips. The caterpillar occurs during certain seasons in an epidemic form and does considerable damage to the crop by feeding voraciously on the foliage and defoliating it completely. The insect was identified at the Agricultural College and Research Institute, Coimbatore as *Eupterote canaraica* :

Distribution and habits : Mayne (1942) has recorded a severe outbreak of the pest in 1937 - '38 in North Coorg, South Mysore and Cardamom Hills. Jones (1944) has referred to the pest as becoming serious only periodically and in restricted areas. The caterpillars were found to descend from shade trees in enormous numbers at night and attack and consume the entire foliage of cardamom leaving behind only the midribs of leaves. They march on from field rapidly defoliating extensive areas. During day time they take shelter under leaves and in dark situations on tree trunks. But stray specimens can be noted feeding on the leaves even during day time. *Makaranga roxburghii* (Vattakkann) plants growing among cardamoms is a major alternative host plant of this caterpillar. Prevalence of continuous dry weather is said to help the multiplication of this pest.

Control : The control of this pest has been a problem all these years and the subject could not be pursued for any indicative results as the occurrence was of sporadic nature and it cannot be foreseen when the pest would occur. Only mechanical methods, like destruction of colonies of gregarious caterpillars in easy reach on tree trunks at day time, had been in practice so far with partial relief.

Chemical control : For large scale outbreaks of pests mechanical methods are inadequate for effective control and hence the discovery of a suitable insecticide to deal with the pest readily and effectively will prove to be a boon to the cardamom planters. Reports of a ruthless devastation of the crop by the pest were received from planters of Madura district in January - February 1953 by the Entomology Section, Coimbatore and the opportunity was availed of to test the different

insecticide with us now. Special care was taken to have proper representation of the chlorinated hydrocarbons and organic phosphorus compound in the latest synthetic chemicals. Trials were conducted at Kumali (Madura district) in February 1953 with a view to control the caterpillars found remaining on tree trunks and cardamom plants during day time. The data gathered is furnished below :

Mortality data in respect of the different treatments

Treatment	After 24 hrs.		After 48 hrs.		After 72 hrs.		After 96 hrs.		Total		Percentage of mortality			
	D. A.		D. A.		D. A.		D. A.		D. A.		24 48 72 96			
											hrs. hrs. hrs. hrs.			
1. Toxaphene 10% dust	..	20	2	18	..	18	..	18	2	18	nil	10	10	10
2. BHC 5% dust	..	20	4	16	4	12	1	11	9	11	nil	20	40	45
3. DDT 0.2% spray	..	20	7	13	2	11	1	10	10	10	nil	35	45	50
4. Lindane 5% dust	6	14	4	10	2	8	..	8	12	8	30	50	60	60
5. BHC 10% dust	6	14	6	8	2	6	..	6	14	6	30	60	70	70
6. BHC 0.1% spray	9	11	5	6	3	3	..	3	17	3	45	70	85	85
7. Product 1250 - (lb. in 10 gals)	4	16	16	..	..	..	..	..	20	..	20	100	..	..
8. F. O. R. S. (1 lb. in 4 gals)	20	..	..	..	..	..	..	..	20	..	100	..	..	..
9. F. O. R. S. (1 lb. in 6 gals)	20	..	..	..	..	..	..	..	20	..	100	..	..	..
10. F. O. R. S. (1 lb. in 10 gals)	20	..	..	..	..	..	..	..	20	..	100	..	..	..
11. Parathion 0.025%	20	..	..	..	..	..	..	..	20	..	100	..	..	..
12. Control	..	20	1	19	..	19	..	19	1	10	nil	5	5	5

Note :— D—Dead.
A—Alive.

Order of efficiency: (1) Best :— F. O. R. S. and Parathion.
(2) Next in order is Product 1250, but there was delayed action with this.
(3) BHC 0.1% spray.
(4) BHC 10% dust.
The others are poor.

The cost of treating an acre of Cardamom with Fish oil rosin soap and Parathion at 100 gallons per acre will be Rs. 9—8—0 and Rs. 25—5—0 respectively. Parathion, however is an all round insecticide and controls many of the other pests also.

It can be seen that Fish oil rosin soap even at 1 lb. in 10 gallons of water was capable of accounting for cent percent mortality of the caterpillars in a period of 24 hours after treatment. Parathion 0.025% also effected complete kill in the same time. Next in order of efficiency was Product 1250 of Messrs. Geigy Insecticides at 1 lb. in 10 gals. of water which caused complete mortality in 48 hours after treatment, though it meant delayed action when compared with Fish oil rosin soap and Parathion. BHC 0.1% spray, BHC 10% dust and Lindane 5% dust caused only 85%, 70% and 60% mortalities respectively even after 96 hours of treatment. BHC 5%, Toxaphene 10% and DDT 0.2% were poor in action.

Of all the insecticides tried, Fish oil rosin soap is cheap, non poisonous and effective in controlling the pest by its contact action, but it does not have any residual action on the pest, nor can it be purchased in heavy stocks from the stocks prepared and kept. It is generally prepared to order and supplied by the Kerala Soap Institute, Calicut. It is the sticking contact effect of this insecticide that accounts for the death of this caterpillar. Product 1250 (a Geigy Insecticides product) at 1 lb. in 10 gals. offers promise. Although Parathion possesses high lethal potency capable of killing the caterpillars in 24 hours after treatment, it is a material for use under proper care as there is human toxicity hazard with it if the concentrated solutions are allowed to come in contact with the skin.

Investigations on the control of this pest by applying stomach poisons on the plants with a view to annihilate it when it feeds on the leaves, did not yield conclusive results.

With the information we have now from the recent chemical trials conducted for control of this pest we can recommend a low dosage of Fish oil rosin soap 1 lb. in 10 gals. of water, when stocks of this soap are available and Messrs. Geigy Product 1250 or Parathion 0.025% (Ekatox 20, 1 oz. in 5 gals. of water) where its handling can be done under proper supervision to avoid human toxicity hazard.

The note is furnished with the object of drawing the attention of readers to this sporadic pest for trial of different chemicals that are pouring into the market when Eupterote caterpillar outbreaks occur in cardamom plantations so that we can have the cheapest and the best for its control.

Effect of Seasonal Variations on Nitrate Content and Water Soluble Salts

By

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Opinion differs regarding the actual significance of soluble plant nutrients extracted from the soil by different chemical solvents. School of thought led by Dyre (1894) and Morgan (1936) believes that the nutrients extracted by different mixture of acids and salt solutions represent the actual plant food present in the soil whereas the other school led by Mitscherlich (1929) and Neubauer (1923) determine the availability of nutrients by actual crop growth. But inspite of considerable amount of research done in support of both the schools, the crop response cannot be predicted from the figures obtained by any of these methods.

Water-extract represents the water soluble nutrients which are most easily absorbed by the plant roots. Other extracting reagents for available nutrients however, indicate that the plant roots extract nutrients to a greater degree from the soil and such a state comes into operation with seasonal variation and microbiological changes in the soil.

Seasonal variations in nitrate content of soil has been studied in different countries by numerous investigators. In India Leather (1911) Clarke (1922) and Batham (1927) studied the accumulation of nitric-nitrogen in soil during the different periods of the year and observed that maximum accumulation of nitrate occurred during summer months and the minimum in winters.

Menchikovsky [1936] studied the various changes in the water soluble salts of Solaga soil of Palestine and observed that for the surface soil during the dry season (June to October) the concentration of soluble salts was similar to that of soils in arid regions, whereas during the rainy season (November to March) it was similar to that of soils in humid regions.

King and Whitson (1901) observed that the nitrate and total salts in the first foot of the surface soil in the spring was comparatively small in amount, increasing somewhat rapidly until June 1st for clover and until July 1st for corn and potato fields, beyond these dates they fell more or less rapidly until August 1st when crop was growing most vigorously. Later on they remained nearly constant with a general tendency to rise slightly until September.

In India no attention has been paid towards these seasonal changes in the water soluble salts. Sahsrabudhe (1927) studied the soils of the Bombay Presidency and classed the soils into 3 groups - good, fair and

poor. According to him in good soils the total soluble salts usually do not exceed 0.1%. In the U. P. water-extract analysis of Unao and Sandila Tahsil of Hardoi District has been studied by Agrawal and Mukerjee (1946) on profile basis and found the water soluble salts upto 0.07 %.

In tables I and II has been given the amount of nitrates present both in surface soil and sub-soil for two years. The natural moisture contents of these plots have also been recorded in the table to give a picture of the nitrates and soil moisture for plant growth.

TABLE I
Seasonal variations in the nitrate and moisture content of soil
1948—1949

Months	MANURED.				UNMANURED.			
	0" - 6"		6" - 1'		0" - 6"		6" - 1'	
	Moisture %	NO ₃ -N p. p. m	Moisture %	NO ₃ -N p. p. m	Moisture %	NO ₃ -N p. p. m	Moisture %	NO ₃ -N p. p. m
August 1948	.. 16.4	4.0	14.2	7.2	15.7	4.1	14.3	6.9
September	.. 15.9	3.2	13.5	8.5	15.1	3.7	14.1	7.5
October	.. 16.0	9.2	15.9	7.0	13.6	8.7	14.0	6.8
November	.. 13.0	4.4	13.7	2.3	10.6	3.9	11.0	2.0
December	.. 13.0	3.4	14.0	2.1	14.0	3.5	14.2	1.7
January 1949	.. 14.9	3.2	14.5	2.8	15.8	3.2	16.4	1.8
February	.. 12.9	3.3	12.5	2.9	12.7	3.2	13.0	2.7
March	.. 9.6	5.3	11.2	2.4	7.9	5.4	10.5	1.9
April	.. 5.3	10.6	9.3	1.2	3.4	10.1	7.5	1.0
May	.. 2.9	10.3	5.9	1.1	0.9	9.5	2.4	1.0
June	.. 0.8	10.3	1.5	3.0	0.4	9.6	1.4	2.9
July	.. 20.3	3.8	17.0	8.8	19.7	3.4	16.5	8.4

TABLE II
Seasonal variations in the nitrate and moisture content of soil
1949—'50

Months	MANURED.				UNMANURED.			
	0" - 6"		6" - 1'		0" - 6"		6" - 1'	
	Moisture %	NO ₃ -N p. p. m	Moisture %	NO ₃ -N p. p. m	Moisture %	NO ₃ -N p. p. m	Moisture %	NO ₃ -N p. p. m
August 1949	.. 18.3	2.0	17.5	8.1	18.1	1.5	17.2	8.2
September	.. 14.3	4.9	12.9	8.9	14.1	3.9	13.1	8.5
October	.. 15.9	8.7	15.3	6.3	15.3	6.9	14.1	5.3
November	.. 17.5	5.1	15.3	2.7	16.9	3.7	16.2	2.0
December	.. 12.6	3.0	13.5	2.3	11.9	2.6	13.0	1.7

TABLE II (Contd.)

		MANURED.					UNMANURED.		
January 1950	..	15.3	2.9	15.9	2.7	15.7	2.0	16.9	1.9
February	..	11.4	3.2	12.0	2.3	11.2	2.4	11.7	1.0
March	..	10.7	8.7	11.6	2.4	8.9	6.3	11.3	1.3
April	..	5.9	10.1	7.3	1.2	4.2	8.4	7.9	1.0
May	..	2.1	9.7	5.1	1.1	1.3	7.9	2.7	1.0

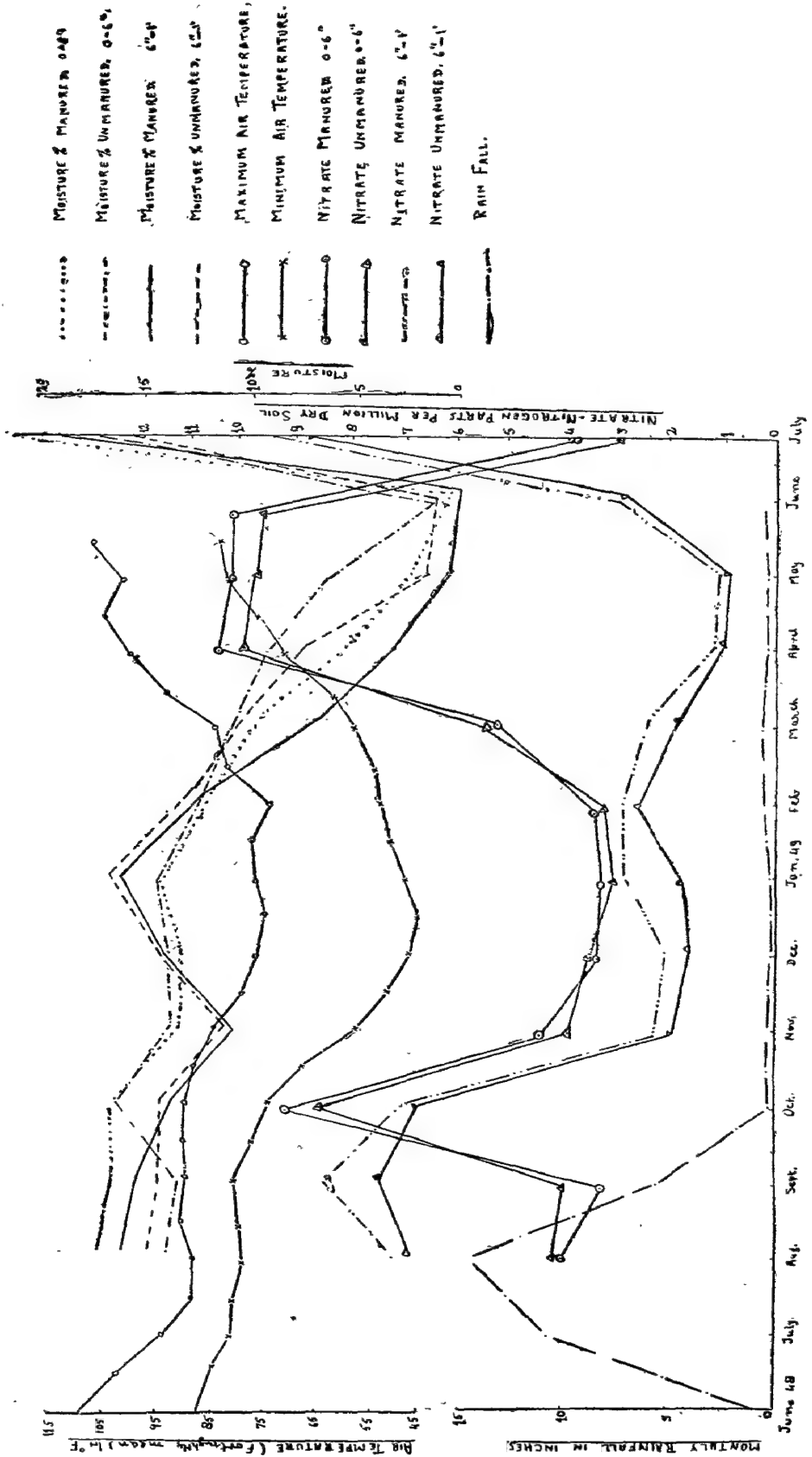
Results in tables I and II show that soil moisture is greater in the top soil during the rains than in the sub-soil. After the rains the sub-soil possesses greater amount of moisture. The manured soil contains more moisture than the unmanured soil in summer. This is apparently due to the organic matter content of the manured soil where the organic matter has increased the water-holding capacity.

In the sub-soil, on the other hand, we find that in dry months the moisture was higher than the surface soil. This is due to the loss by evaporation from the surface soil or due to the removal of the soil moisture by the plant roots. During rains, the increased nitrate in the sub-soil indicates leaching, while during dry months the leached nitrate rises to the top. From figures in Tables (I and II) it will be seen that there are two maxima in nitrate accumulation in the top soil, one during October, the sowing time of Rabi crops and the other during summer when there is no crop, reaching the highest accumulation in April. Both the periods giving maximum nitrate in the soil coincide with the fallow period and nitrification.

Since nitrification depends upon climate, organic matter and cultural operation etc., it was considered desirable to represent these graphically. Figures I and II show that there is some relationship between the nitrate content of the soil and rainfall and temperature. With maximum rainfall there is apparently more leaching of nitrate and this agrees with the maximum nitrate in the sub-soil. During the dry period the maximum nitrate in the top soil is directly related with the maximum temperature. This is due to rise of the nitrate from the sub-soil to the top and also to the increase in the intensity of nitrification. This agrees with the observations of Hall (1922) and Russell and Appleyard (1917). The winter depression in the nitrate in both the layers of the soil is due to the utilization of nitrate by the growing crop. Similar observations are recorded by Fraps (1920) and Jensen (1910).

In the water extract calcium, magnesium, phosphate, carbonate, bicarbonate, sulphate and chloride were determined every month for two years in succession to find out the effect of the growing crop on the concentration of the soluble salts in the respective plots. Results are incorporated in tables III and IV.

FIG. 7. SEASONAL VARIATIONS IN THE NITRATE CONTENT,
1948-49.



MONTHLY DURATION

FIG. II. SEASONAL VARIATIONS IN THE NITRATE CONTENT.

1949-50

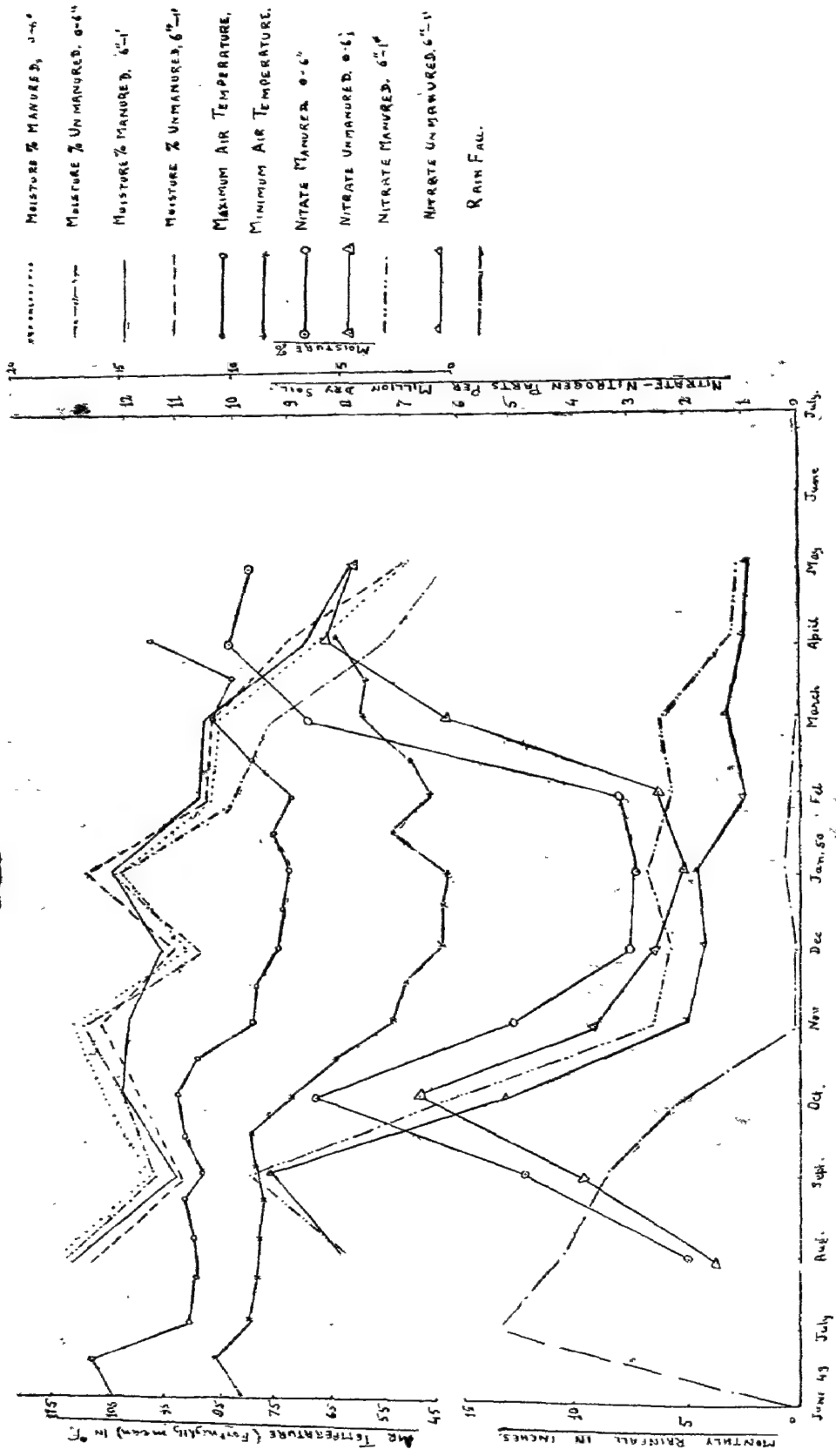


TABLE III
Seasonal variations in water-extract in mgm % 1948-'49

Months	MANURED.					UNMANURED.				
	CaO	MgO	P ₂ O ₅	HCO ₃	Cl	CaO	MgO	P ₂ O ₅	HCO ₃	Cl
August 1948	.. 7.8	4.6	0.93	28.8	5.32	8.1	4.7	0.92	26.4	5.50
September	.. 7.4	4.0	0.63	23.8	2.84	7.2	4.2	0.89	22.2	2.80
October	.. 6.9	3.9	0.57	18.8	2.14	6.6	3.4	0.51	19.9	2.26
November	.. 6.1	3.0	0.59	18.0	2.12	6.0	3.1	0.48	18.6	2.10
December	.. 5.2	2.7	0.52	16.3	2.10	5.1	2.5	0.52	17.6	2.00
January 1949	.. 5.8	3.1	0.56	17.8	2.14	5.3	2.9	0.54	15.2	2.12
February	.. 6.5	4.0	0.70	20.3	3.42	6.9	3.6	0.69	20.8	2.80
March	.. 10.2	5.7	0.73	35.3	3.82	9.8	5.3	0.77	30.8	3.76
April	.. 13.2	8.8	0.66	42.1	4.70	13.2	6.9	0.62	39.6	3.82
May	.. 14.6	8.4	0.31	47.6	5.68	14.2	7.7	0.31	43.2	4.10
June	.. 15.9	6.3	0.31	49.1	5.74	15.6	6.5	0.36	47.4	4.26
July	.. 13.6	5.3	0.46	39.8	5.54	13.4	5.4	0.46	39.1	5.10

N. B. There is no CO₂ and SO₄ in water extract.

TABLE IV
Seasonal variations in water-extract in mgm % 1949-'50

Months	MANURED.					UNMANURED.				
	CaO	MgO	P ₂ O ₅	HCO ₃	Cl	CaO	MgO	P ₂ O ₅	HCO ₃	Cl
August 1949	.. 8.7	4.6	0.76	25.4	4.32	8.5	4.5	0.62	27.1	4.17
September	.. 7.2	4.4	0.85	24.9	3.40	7.4	4.3	0.70	26.7	3.70
October	.. 6.8	3.5	0.59	19.4	2.37	6.4	3.0	0.54	19.8	2.94
November	.. 6.2	2.9	0.55	16.9	2.02	5.9	2.5	0.59	16.9	2.94
December	.. 5.5	2.3	0.57	15.4	2.00	5.1	2.1	0.61	15.5	2.42
January 1950	.. 5.9	3.5	0.63	16.5	2.12	6.5	2.4	0.64	16.9	2.48
February	.. 6.9	4.3	0.72	20.4	3.26	6.7	3.9	0.72	21.7	3.40
March	.. 10.3	6.7	0.73	30.5	3.97	10.4	7.6	0.79	29.6	3.81
April	.. 13.6	8.3	0.45	35.9	4.50	13.7	8.5	0.39	37.2	4.30
May	.. 14.5	8.8	0.32	40.3	5.20	14.3	8.8	0.29	40.7	5.08

N. B. There is no CO₂ and SO₄ in water-extract.

It may be seen that the concentration of calcium in water-extract reached its maximum of 15.9 mg.% in June after the harvest of wheat. In subsequent months it decreased due to leaching by rains during July,

August and September dropping down to 7 to 8 mg.%. The decrease from October upto December is apparantly due to the absorption of the nutrients by the growing crop. Magnesium behaved similarly. Due to the high calcium and magnesium content these soils may be classed as chestnut-brown soil. Phosphate, on the other hand, showed a decline after the crop was harvested in March due to the fixation of water soluble phosphate in the soil. During dry months the phosphate content dropped down to 0.29-0.31 mg.%; with the onset of rains the phosphate content again went upto 0.8 to 0.9 mg.% during August and September. This increase may be attributed to hydrolysis and action of carbonic acid due to increased microbial activity. Bicarbonate and chloride follow the same course as calcium and magnesium which shows that the ions which are held in combination with calcium and magnesium are chloride and bicarbonate. This is expected because calcium phosphate is insoluble in water.

Recently Hoagland (1923), Jenny and others (1939) have suggested that a direct contact relation operates between root and soil colloids for the supply of plant nutrients to crop. Novertheless, the soil solution mechanism by no means loses its importance because of the possibilities of contact adsorption. Certain ions, notably nitrate ions, are not absorbed to any important degree by the soil colloid and anions present in the soil solution must necessarily be accompanied by equivalent quantities of cations.

Now turning to the question of water solubles and nitrate-nitrogen it is striking that the values for both of them are almost identical in the manured and unmanured soils throughout the period of two years of these investigations. This appears anomalous but this similarity in water soluble and nitrate nitrogen may be accounted for by the labour the plants have to perform to satisfy their daily requirements by throwing out roots in unexplored regions of the soil, disrupting mechanically and bringing into the solution minerals by the action of root excretions due to greater metabolic activity, this naturally affects the health and yields of the plants giving poorer yield. On the other hand the manured soil provides readily available food to the plants thus giving healthier and vigorous plants and increased yield.

Summary: Attempts had been made to determine the amount of nitrate and water soluble salts during the different parts of the year. It was observed that there was a great difference in the amount of nitrate and water soluble salts during the different parts of the year. There were two maxima in nitrate accumulation in the top soil, one during October and the other during summer. Some relationship was observed between the nitrate content of the soil and rainfall and temperature. The water soluble salts were maximum during summer and minimum during rains, but phosphate behaved otherwise.

REFERENCES.

- | | |
|----------------------------------|---|
| Agrawal, R. R. and Mukerjee, P. | (1946) Ind. J. Agr. Sci. 16 : 483. |
| Batham, H. N. | (1927) Soil Sci. 24 : 200. |
| Clarke, G. | (1922) Agri. J. India 17 : 463. |
| Dyer, B. | (1894) Trans Chem. Soc. 65 : 115. |
| Fraps, G. S. | (1920) Tex. Agr. Exp. Sta. Bul. 259. |
| Hall, T. D. | (1922) Soil Sci. 12 : 301. |
| Hoagland, D. R. | (1923) Soil Sci. 16 : 225. |
| Jenny, H. and Overstreet, R. | (1939) Soil Sci. 47 : 257. |
| Jensen, C. A. | (1910) J. Amer. Agron. 8 : 10. |
| King, F. H. and Whitson, A. R. | (1910) Wis. Agr. Exp. Sta. Bull. 85. |
| Leather, J. W. | (1911) Dept. Agr. Mem. (Chem. Ser) 2 : 101. |
| Menchikovsky, F. | (1936) Soil Sci. 42 : 167. |
| Mitscherlich, E. A. | (1929) Scottish, J. Agri. 12. |
| Morgan, M. F. | (1930) Connecticut. Agr. Exp. Sta. |
| Neubauer, H. | (1923) Zeit. F. Pflanz. Dung A. 2 : 329. |
| Ressell, E. J. and Appleyard, A. | (1917) Jour Agr. Sci. 8 : 385-417. |
| Sahsrabudhe, D. L. | (1927) Dept. Agr. Bombay. Bul. 160. |

Threshing Paddy with Tractors

By

Joint Director of Agriculture (Engineering), Madras

There are considerable variations in the practice of threshing paddy in the different rice-growing tracts. In the Southern districts, paddy threshing is done in two ways. Initially grain is separated by beating the sheaves on the ground and what is left after this beating is subsequently trodden by cattle. In Malabar and South Kanara, the sheaves are beaten out on boards and subsequently beaten again with sticks. The common factor in all these practices, is the employment of manual or animal power. It is a well known fact, that (1) these processes are not very efficient, and that grain losses by such methods range as high as 10 to 15% of which about 3% occurs between the cutting and transporting of rice sheaves from the field to the threshing floor (2) the cost of these operations are high as a large number of cattle and men are required. On an average it is estimated that about 30 pairs of cattle, working for about 8 to 10 hours a day would be required for threshing paddy got from 10 to 12 acres. This will generally give about 150 to 180 bags of paddy. Added to this, losses may be expected from the consumption of the sheaves by the cattle and in this period, each animal is said to consume paddy sheaves corresponding to an average of 10 to 15 lb. of grain which roughly adds another 2% to the losses during threshing.

An attempt has, therefore, been made by Sri D. Gopala Rao an enterprising ryot of Kakinada and by the Kamineni Farming Corporation

of Gudiwada to thresh on a bulk basis paddy with the aid of rubber tyred tractors by driving the tractor round on the spread out sheaves, at a slow speed of 4 to 5 miles per hour, which, however, is much faster than the normal speed at which cattle move round. The high clearance of the tractor and the weight of the tractor aided by the rubber tyred wheels have resulted in expeditious and economical completion of threshing operations resulting in both saving of time and operational charges to an appreciable extent. The threshed grain is also found to be in a much cleaner condition and there is no damage whatsoever to the grain. The cost of threshing operations works out considerably cheaper than the usual method wherein cattle and men are engaged,

The comparative costs with tractor threshing and threshing with cattle are as follows :—

I For 700 bags of grain as worked out by Kamineni Farming Corpn. Gudivada.

		Rs.	A.	P.
<i>Tractor.</i>	Time 43 hours Fuel 16 glns HSD ...	28	0	0
	Driver's wage ...	8	0	0
	20 men per day for 4 days ...	160	0	0
		<hr/>		
		196	0	0
<i>Bulls.</i>	Time 120 hrs. 20 bulls at Rs. 30/- per day ...	360	0	0
	10 men per day for 12 days ...	240	0	0
		<hr/>		
		600	0	0
	Plus loss on account of feeding by cattle ...	300	0	0
		<hr/>		
		900	0	0

II For 200 bags as worked out for Sri D. Gopala Rao, Kakinada.

		Rs.	A.	P.
<i>Tractors.</i>	8 hrs. working of tractor @ Rs. 8/- per hr. ...	64	0	0
	10 men for shifting at Rs. 1—8—0 ...	15	0	0
		<hr/>		
		79	0	0
<i>Bulls.</i>	30 pairs at Rs. 2/- per pair ...	60	0	0
	30 men at Rs. 1—8—0 ...	45	0	0
	loss of 5 bags @ Rs. 25/- ...	125	0	0
		<hr/>		
		230	0	0

From the above data the average ratio between tractor threshing and cattle threshing works out to 1 : 4.

Paddy threshing with wheel type tractors may, therefore, soon replace, with saving in time and costs, the present inefficient laborious method of threshing with cattle.

The results of these exploratory trials further show, that during a full day's working nearly 200 bags of paddy can be threshed with the help of a tractor and the cost of threshing paddy amounts to less than one third of the cost of threshing by the usual cattle and manual labour. The time required for threshing with the tractor is also about one third of that normally needed by the old method with men and animals. There is the added advantage of the grain so threshed being clean and undamaged unlike in the case of hard beating and trampling. It is also stated that these have shown cent percent germination.

When compared with the time honoured method, the straw obtained from the pneumatic tyre threshing is more mellow and soft. It is also not contaminated during the process by either urine or dung of cattle.

In some of the principal delta tracts threshing operation goes on for over two or three months. Sometimes even extends late in the cold season and is a laborious and time consuming work. When the rainy season interferes with the harvest period, serious losses occur on account of the sheaves getting drenched and the grains sprouting. The usual delay caused by lack of animals and manual labour during the harvest period and loss occurring on account of wet weather, as well as other incidental factors can, with advantage, be overcome by the use of such pneumatic tyred tractors.

This is a new and economical use to which wheeled tractors could be put to not only for paddy threshing but also for any other grain crop all over. Individual owners of such machines can also hire out their tractors for a nominal charge to their neighbours and help them get through their threshing in proper time and with appreciable economy.

There are also a number of tractors belonging to the Agricultural Department in all the districts and these could be had for hire by farmers for threshing purposes. There will, probably, be much greater savings in time and cost, if a small side delivery hay rake is used in conjunction with a tractor during the threshing.

The Midrib of Palmyra Leaf

By

K. NARAYANAN NAIR

Assistant Marketing Officer, Trichy

Many may not be aware that the midrib of palmyra leaf contributes towards the dollar earning power of our country. In this note an attempt is made to give a brief account of its story from its origin for palmyras of the arid regions of the Southern Districts, to its being used in the mechanical sweepers in the busy Municipal Corporations of the United States of America, Australia and other foreign countries.

The Southern Districts of Ramanathapuram, Tirunelveli and Madurai have extensive tracts where rainfall is considerably low and lands are more or less lying waste or are poor in fertility. The Palmyra is the only vegetation that successfully exists in these regions as can be seen while travelling in a train. Vast groves and long lines of these trees thrive in these barren stretches.

It is well known that the palmyra tree serves man and beast in several ways. From root to the very tip, all its parts find some use or other. As a building material, few other timbers exceed the outer core of the mature palmyra trunk for use as rafters, bressummers, beams etc. The pithy inner portion of the trunk is a good feed for animals including elephants. The tender portions of the top, beneath the crown, is a delicious dish. The use of its sweet juice as a drink and for the manufacture of jaggery is too well known. As a thatching material and for the manufacture of myriad of articles like mats or baskets, fans or hand bags, toys or hats, its leaf is of surpassing utility to man. It is also a cattle feed. The leaf stalk and its sheath are of immense use as a source of cheap fibre. None in our country can forget the marvellous refreshing effect of its tender fruits when taken during mid-summer noons.

The ripe fruit is an important item of food in these famine stricken areas. The tender sprouts of 4 to 6 months age is an item among the eatables for the villager. The leaf sheath surrounding the trunk of the young palmyra before it begins to flower, gives an excellent fibre which is largely exported to foreign countries for the manufacture of various kinds of brushes and brooms. Incidentally, it should not be forgotten that this fibre also earns a good amount of dollars. Before the advent of paper in India the long ivory white leaves were used for *Cudgeon* records and many valuable manuscripts of ancient days are in palmyra leaf. Besides these, there are also several other uses of its various parts and it may not, therefore, be inappropriate to call it '*the standing camel of the South*'.

The midrib of the palmyra leaf, which is thrown off after the removal of the leafy portions for manufacturing mat, basket etc., is the subject matter of this note. On a very rough estimate, nearly Rs. 25/- lakhs worth of articles are manufactured annually from palmyra leaf and nearly 3,000 to 3,500 tons of palmyra midribs are produced as a by-product.

In the early thirties, this midrib had practically no other use, except as brooms locally or for the manufacture of baskets for packing onions intended for export to Malaya and Ceylon. But at about this period there was a small demand for it from New York and there it was found to be quite suitable for making brooms, and rapidly, after the commencement of the World War II, its use as the main functional part in the machanical sweepers grew in importance with a corresponding increase in demand from that country. At present, though the main demand is from the United States of America; United Kingdom, Australia and China also import this from India.

Tuticorin in the south is the only place where these midribs are processed, packed and exported to the foreign countries. These midribs go by the name '*Palmyra Stalks*'.

Ramanathapuram, Nanguneri, Srivaikuntam, Tiruchendur, Pudukottai and Tirupattur are the main centres where articles out of Palmyra leaf are manufactured largely and hence these midribs are also obtainable in these centres. Village merchants purchase small lots of these from individual families engaged in mat weaving or manufacture of other articles out of the leaf and transport them to Tuticorin by rail, lorries or bullock carts, as the case may be. The village site price of these stalks varies from Rs. 10/- to Rs. 14/- per cwt.

In the form in which these midribs are removed by the weavers a large portion of the palmyra leaf is also left with these. This adhering leafy portion is removed either entirely or partially, depending upon the quality demanded from the foreign markets, because, United States of America, United Kingdom and Australia want only a coarse quality which tolerates a small width of the leaf of $1/12''$ to $1/8''$ adhering to the rib. But China wants only clean midribs. In the market the quality of the midrib is adjudged by its length and by the width of the leafy portion. The larger length fetches better prices and the broader leafy portion lowers the quality. The removal of the leafy portion is done by women-folk on contract wages and they are paid at the rate of As. 2/- per 10 lb. of cleaned midrib. The wastage varies from 15 to 25%.

The cleaned midribs are made into bundles with the bottom ends at the same level. These bundles which generally weigh from 50 to 80 lb. are placed vertically with the bottom portion resting on the

grounds and women labour is employed to sort them into various grades according to the length. These women are well trained at this work and they go on pulling out handfuls of longest ones to begin with and thus group handfuls of the same length together until they complete the entire bundle. This work of grading is paid at the rate of Rs. 0—2—9 per 70 lbs.

After the grading into different lengths the slender tops about 9" to 1' from the tip are cut away. These are further cut into convenient lengths of 12", 14", 16", 18", 20", 22", 24" and 26". Five men, paid at Rs. 1—8—0 per day, are able to effect these cuttings of about 30 to 40 cwts. of stalks. The cut stalks are made into hanks. One woman at Rs. 0—12—0 per day is able to hank about 1 to 1½ cwts. of cut stalks.

Demands for different lengths vary from country to country, firm to firms and from time to time. Generally United States of America places orders for 16", 18", 22" and 26" lengths, while Australia requires stalks of lengths between 6" and 14". China demands 22" length and the requirements of the United Kingdom are for 8" to 10" lengths.

Packing is done by hand presses in ballasts of 1 cwt. each bundle. Only one particular length is packed in each ballast. These ballasts are pressed with battons of bamboo splits and tied up with iron hoops and are finally covered with gunnies. In the case of consignments intended for Australia bamboo splits are not used as Australia insists on fumigation certificates for the bamboos splits to be free of borers. Ballasts are therefore covered with coarse palmyra mats. The labour charges for packing and pressing are Rs. 0—4—0 per ballast and the packing material costs Rs. 2—4—0 per ballast. The midribs are ready for loading into the Ship.

Except in China where these are said to be in use for the manufacture of hats, it is said that these stalks are mainly used in machine sweepers as they are soft and are capable of bending to a greater degree than other similar materials.

There are ten processing factories in Tuticorin which mainly deal in Palmyra fibre and stalks. Some of them have their canvassing and selling agents in the United States of America and other countries. They obtain orders through them or even directly at times. The average export of these midribs for the last five years is 40,886 cwts. or 2,044 tons. At the present rate of Rs. 25/- per cwt. f. o. b. the value of this quantity comes to Rs. 10,22,150/-. Thus it will be seen that these stalks are an important exchange currency earner in the countries to which they are now sent.

Before concluding this note, it is equally necessary to point out in this connection that while the palmyra trees are providing employment to thousands of families in these famine areas and are an important

source of foreign currency requiring little care or attention from its owners, they are put to a great deal of misuse by excessive defoliation and desheathing. As indicated in the earlier part of this note, for the extration of fibre, the sheaths of younger trees are required. Due to indiscriminate removal of sheaths which take away most of the leaves of the young trees, the trunks become thinner and thinner and the trees die out even before they come to flowering. Excessive and indiscriminate removal of leaves also reduces the life of the trees. It is, therefore, important for the safety and well-being of the palmyra that the young tree is left untouched until it is 8 to 10 years old. The leaves of less than one year old tree should not be cut either for the purpose of leaves or for sheath. It is also desirable that the planation of palmyras along field bunds and in waste lands should be systematically extended, so that it will continue to serve mankind in multifarious ways.

Tale of a Misfire

By

R. M. SAVUR

Y. R. Farm, Kanhangad

I have written about what a valuable 'find' *Sesbania speciosa* is for the farmer and that sooner than later, Mr. M. S. Sivaraman's vigorous and persistent campaign to popularise it will succeed in making every farmer realise its value for building up and maintaining fertility. Another idea of Mr. Sivaraman's most unfortunately misfired, equally unfortunately Mr. Sivaraman himself seems to have forgotton it. I am writing this to tell everybody why I believe that this will prove to be as valuable a find to the South Indian farmer as *Sesbania*.

This tale of a misfire began in Mr. Sivaraman's first, all too brief period as Director of Agriculture with a very short press note about *Leucaena Glanca*. The brief paragraph said that this was something of great value because an acre of it would in a year begin to give fifty tons of something whether it was fuel, or green manure or what I cannot remember-nor can anybody else I know recollect. Seeds of *Leucaena Glanca* were supplied to Agricultural Research Stations with orders to grow it and they all dutifully did so. Then Mr. Sivaraman was transferred to some other department everybody promptly forgot all about this wonder plant. Fortunately the standing orders were not cancelled and the plants are still living neglected and forgotton in some corner of every Research station. You cannot blame anybody for neglecting a plant

which he does not know how to use. The plants, however, are living, flowering and seeding. Nobody cares even to collect the seed. Normally under such conditions either an impenetrable forest would have developed or the plants would have died. But in this case neither happened. The plants are so hard, that they refused to die, the seeds are so hard that they refused to germinate where they fell.

The interest aroused by my perusal of the press note made me scrounge a few seeds of *Leucaena* and plant them. Barely two or three seeds germinated and the seedlings made such poor growth that I lost all interest and the plants died away. My awakening to full realisation of the immeasurable value of this species was a slow and long process. However, this realisation has been so thorough that this year I have gone in for it in as big a way as I have done with *Sesbania Speciosa*.

As I am eager that other progressive farmers should share the knowledge I have acquired about this species and benefit by its culture as I hope to do I am writing about it.

In my study of agricultural literature the first mention I came across of Wild Tamarind or *Leucaena Glauca* was in the joint publication, No. 10 of the commonwealth Agricultural Bureau entitled 'The use and misuse of shrubs and trees as fodder with table showing composition and digestibility'. This is an exhaustive study occupying over 230 large pages, of the fodder trees and shrubs of the world. Yet this book dismisses *Leucaena Glauca* with one short sentence in the text that it is a shrub and with a place in the table of Chemical composition and digestibility. This certainly was not calculated to arouse anybody's enthusiasm.

Next I came across it in the chapter on 'Research on fodder production in Hawaii' in Bulletin No. 31 of the commonwealth Bureau of Pastures and field crops. Where *Leucaena Glauca* and red gram are said 'to appear to be most promising being perennial and well adopted to zones of moderate rainfall or when irrigated to dry zones'. Experiments made to determine yields when cut periodically for porage were all made, when the plant was provided with ample irrigation. No porage plant which requires irrigation is of any use to me on this sandy desert. When the study further confirmed that very low germination is experienced when this porage crop is sown because dormancy or delayed germination is due to the presence of a very thick, many layered seed coat which hinders the absorption of water by the seeds, I gave no more thought to this species.

A couple of years later, that is in last December, I got a chance of reading the 1948 U. S. D. A. Yearbook 'Grass' when I read what it had to say about *Leucaena Glauca* literally and metaphorically, I set up and took notice and made a note of it. I reproduce what I noted down.

“ We found that in most respects it is hardy and adaptable and can be handled much like any other perennial row crops. It grows slowly at first and from 6 to 9 months are required before the first cutting can be made. The optimum yields are at about 4 months intervals when the new growth is about waist high. Cutting at 2 to 4 inches above ground level gives yields essentially the same as at higher levels. Yields of 25 tons of green porage and 2700 ku. of protein per acre were produced. *One of its most valuable characteristics is its ability to produce good porage yields without irrigation where the natural rainfall is as little as 2 to 4 inches.* Under similar conditions Napier grass requires irrigation every 10 to 12 days.

Milk production at the University Farm have shown that 55 lbs. of fresh Leucæna a day for each cow provided as much digestible protein to replace all the Soy-bean meal in the supplemental feed, with the significant lowering of production’.

About this time I had brought a book entitled ‘Improving the World’s grasslands’. Facing page 130 of this book are five photographs of Leucæna Glanca with the following captions.

‘One year-old ipil-ipil (Leucæna Glanca) tree growing from seed planted in a dense stand of Cogen grass. When these trees are two years old, they dominate the cogon grass and begin to make conditions favourable for grasses of higher porage value. The ipil-ipil itself makes good forage and is an excellent fuel and pole crop in the Phillippines.

‘Koa Kaole (Leucæna Glanda) ready for periodic grazing at a height of 3 feet. The main stems are regularly trimmed to a height of 3 to 4 feet so that the cattle may have new growth on which to feed.

When I read this I secured all the seeds I could get a raised nurseries. I have been transplanting these seedlings during the last month or six weeks i. e., end of May and whole June, as and when time could be spared from other farm work. During the ten years I have been farming I have tried innumerable species but I have not come across any which is so hardy as this wild Tamarid. From a study of its root development in the nursery and its behaviour on transplanting I am convinced it will prove very drought resistance. Though the extract quoted above says that 6 to 9 months are required before the first cutting can be made I have found that in one of the nursery plots which happened to be in a comparatively fertile spot in my field the plants, though crowded together attained in 2 months, a height of 3 feet and a little over. To that the reaction and the palatability of the cuttings I moved them down to half the height my cattle ate the cuttings with relish. In another six weeks the plants had grown to their original height of 3 feet.

It remained for me to decide how best to plant out the seedlings, whether as a pure stand or mixed with grasses etc., to secure the maximum benefit. The clue to the solution was provided in the caption quoted above and the following paragraph I found in the F. A. O. study 'Improving the World's grasslands'.

In mixed stands of grasses and leguminous shrubs or trees, the grasses are usually more nutritious because (1) the soil is kept cooler by the shade which reduces the rate of humus oxidation (2) the falling leaves are rich in nitrogen and contain minerals brought up from the subsoil and (3) the bacteria in the nodules of the legumes enrich the soil with nitrogen. In Malaya, Jagoe has found that the yield of carpet or Savannah grass is nearly 20 percent greater under the shade of the leguminous rain tree (*Pithecolleium* Sanan). Analysis also shows a higher protein content in grass growing in the shade of trees, under legume shade, 14 percent, under non-legume shade, 11 percent, unshaded, 10 percent. The shade also tends to suppress coarser grasses such as Cogon. Interplanting with *Gliricidia* maculata is recommended until large species, planted at about 100 feet intervals, are sufficiently mature to give the desirable amount of light shade'.

Probably Jagoe had not heard of *Leucaena* Glanca. I am interplanting with both *Leucaena* and *Gliricidia* because I cannot get enough material of one species alone in a hurry.

I hope that this will catch Mr. Sivaraman's eye and tempt him to start a fresh campaign to popularise this wild tamarind, ipil-ipil, Koa Haole, or *Leucaena* Glanca. Now that his *Sesbania* campaign is going with a swing he could safely divert a part of his attention to this valuable species he introduced and forgot about.

Trade Report

For receipts of loose cotton at presses and spinning mills in the Madras State from 1st February 1953 to 31-7-1953 amounted to 1,96,010 bales of 393 lbs. The receipts in the corresponding period of the previous year were 2,18,191 bales. 2,41,085 bales mainly of pressed cotton were received at spinning mills. 1960 bales were exported by sea while 4,897 bales were imported by sea during the week ending 31-7-1953; the progressive totals being 8,475 bales exported and 60,322 bales imported from 1-2-1953 to 31-7-1953.

PROCEEDINGS OF THE THIRTY-SIXTH COLLEGE DAY & CONFERENCE



Dr. R. Nagan Gowda's Welcome Speech

Dr. Nagan Gowda (Minister for Agriculture, Madras) welcoming the Union Minister paid a tribute to Dr. Deshmukh's deep interest in the agricultural progress of the country. He also referred to Dr. T. S. Venkataraman, as one of the most eminent agricultural scientists that India had produced and one whose work on sugarcane was known all over the world. Dr. Nagan Gowda said that graduates who went out of the agricultural colleges were not strong on the practical side because they were not given that type of intensive practical training which would give them confidence not only in the management of their own farms but also in imparting knowledge to others. This point had been taken note of by the recently created Council of Agricultural Education in the final report of the Planning Commission. The Madras Government, therefore, in consultation with the Universities of Madras and Andhra, had drawn up a revised course relating to the B.Sc. Agricultural Degree course which provided for six months of intensive practical training within the duration of a three-year course. The Vice-Chancellors of the Madras and Andhra Universities had given the Government help and guidance in working out the details of the scheme and evinced keen interest in the progress of agricultural education. The scheme would apply to the first year B.Sc., Class this year. For second and third year students, the Government were considering the importance of actual farm work apart from practical work and had invited them to take up such works on Government farms during their vacations and even draw remuneration like any other farmer. Students were also encouraged to do voluntary work and extension service in the villages during their holidays. The scheme for opening an extension wing at the college with the aid of Ford Foundation was put to the Government of India at their instance but had not yet materialised. He hoped that this college and the one at Bapatla would play their due part in agricultural progress in their respective areas and that their products would not make themselves open to criticism that they had not carried fruits of knowledge and research to workers in the fields.

Report of the Secretary of the M. A. S. Union

Ladies and Gentlemen,

On behalf of the Managing Committee of the Madras Agricultural Students' Union I have great pleasure in presenting the report for the year 1952 - '53.

The Union is very fortunate in securing the presence of Dr. Punjab Rao Deshmukh, Minister for Agriculture to the Government of India, on this occasion, to inaugurate the proceedings of the Conference. By accepting our invitation at great personal inconvenience, he has shown his keen interest in matters relating to the increase of food production in the country. He has been one of the most steadfast and sincere workers in the national cause and as Minister for Agriculture in Madhya Pradesh he has wide experience in very many fields like education, co-operation, agriculture and rural development. We feel sure that his ripe experience and wise counsel will be of great benefit in the solution of our immediate problems relating to food production. It is gratifying to note that he has represented the country several times in the conferences organised by the Food and Agricultural Organisation and has brought credit to our country. We trust that he will enjoy his visit to Coimbatore and carry with him happy memories of this occasion. It is also gratifying to record that the happy precedent set up by Sri K. M. Munshi, the former Minister for Agriculture, Government of India, in evincing interest in the Annual Celebration of the Madras Agricultural Students' Union on a previous occasion is being followed up by his worthy successor. On behalf of the Union, kindly permit me, Sir, to thank you for so readily consenting to our request to inaugurate the celebrations of this year's conference.

It is indeed a proud privilege to have on this occasion Dr. T. S. Venkataraman, the doyen of sugarcane research in India, to address the conference. I have great pleasure in welcoming him. It is needless to state that he is a well-known personality among the scientists of India and an international authority on sugarcane. But it may not be known to many that he has been intimately associated with the organisation and progress of the Union and was taking a keen interest in the activities of the Union when he was at Coimbatore. He was the Editor of the Madras Agricultural Journal in 1919 and Vice-President of the Union in 1930. Even after his retirement from service he has been taking a very active part not only in the development of sugarcane but also in the field of Agricultural Research in general. He has been associated with many special Committees pertaining to the organisation and development of agriculture in India. The Union is greatly indebted to Dr. T. S. Venkataraman who has in spite of his old age so graciously consented to be present on this occasion and to address the Conference.

The Madras Agricultural Students' Union: The Union was founded in the year 1911. It was started as an organisation to bring together the past and the present students of the Agricultural College, Coimbatore, as well as its predecessor, the Saidapet College of Agriculture. Since 1945, the past and present students of the Agricultural College, Bapatla, also have joined the Union.

The Union has been an INDEPENDENT and VOLUNTARY ORGANISATION. In addition to its function as a link between the past and present students of the two Colleges, the Union can also claim, through the medium of the Madras Agricultural Journal, to be a centre of information on matters relating to Agriculture with special reference to Madras.

The Madras Agricultural Journal: The publication of the Madras Agricultural Journal is the chief activity of the Union. It was first started as a Year Book in 1911 and later on published as a quarterly journal. In 1915 it was converted into a monthly journal. We are glad to record that the journal continued to be published regularly throughout the year under report. We are proud to note that research workers in other institutions and departments have come to feel that our journal has a place among the scientific publications of the world and are seeking its aid for the publication of the results of their research activities. The journal has secured international importance and has on its exchange list a large number of scientific publications both Indian and Foreign.

Finance: The publication of the Journal being one of the main items of work of the Union, the major portion of its income is expended on it. The high cost of paper and printing charges continue to be a matter of serious concern in the Budget of the Union. In this connection the Union desires to place on record its deep sense of gratitude to the Madras Government for the special grant of Rs. 1,800/- sanctioned since 1948 - '49 and also during the year under report, to meet the high cost of paper and printing and enable the supply of the journal to be made to the students of the Agricultural Colleges at Coimbatore and Bapatla, at less than the actual cost of printing.

The Managing Committee desires to make an appeal to one and all of our College Students, past and present, both at Coimbatore and Bapatla, and to the officers of the Department who are not members of the Union yet, to enrol themselves and to enlist more subscribers and thereby help the Union to become self-supporting in its activities. In this connection we wish to record that in response to our appeal during the previous College Day and Conference and due to the efforts of some of our senior members, over 466 members were admitted during the year.

College Day and Conference, 1952: The celebration of the Annual College Day and Conference is one of the important activities of the Union. The Thirty-fifth College Day and Conference was celebrated last year from the 13th to the 17th August 1952. It was inaugurated by Dr. R. Nagan Gowda, Minister for Agriculture, Government of Madras, and the subsequent sessions were presided over by him. A symposium on "Methods to be adopted to Maximise Production and Development of Improved Strains and Plant Materials" was organised and it gave ample

scope for lively discussion in which a number of officials and non-officials participated.

A detailed account of the proceedings of the College Day and Conference has been published in the August 1952 number of the Madras Agricultural Journal.

Ramasastrulu Munagala Prize: The Ramasastrulu Munagala Prize for 1953 has been awarded this year to Sri A. Shanmugasundaram, Assistant in Paddy, Agricultural College and Research Institute, Coimbatore, for his paper on "Studies on dormancy in short-term rices". Our thanks are due to Messrs. M. Kanti Raj, T. Natarajan and T. R. Narayanan for acting as judges for this year's competition.

Patrons: We are happy to welcome Messrs. V. C. Subbiah Gownder and M. S. Palaniappa Mudaliar of Coimbatore and A. K. Balarama Raju of Rajapalayam as our new patrons.

Retirement: Since our last report the following members have retired from service: Sri V. T. Subbiah Mudaliar, Lecturer in Agriculture, Agricultural College, Coimbatore, Sri P. Krishna Rao, Millets Specialist, Sri V. K. Subramania Mudaliar, Headquarters Deputy Director of Agriculture, Sri Baghirathi Padi, District Agricultural Officer, Sri Govindaramiah, Seed Development Officer and Sri C. M. John, Principal, Agricultural College and Research Institute, Coimbatore. The Union records its thanks for the services rendered by them while they were in service in various capacities as members of the Union.

Obituary: We record with deep sorrow the demise of the following members: Sri V. Muthuswamy Iyer, Sri C. S. Seshagiri Iyer, Sri C. S. Rajaratna Mudaliar and Sri K. C. Ramakrishnan.

Sri V. Muthuswamy Iyer, Retired Lecturer in Agriculture, was closely associated with the activities of the Union from its inception and served it in many capacities as a member of the executive committee, as Secretary, Vice-President and Editor of the Journal. It was during his Editorship that the transition of the Madras Agricultural Journal from a College Magazine to a Scientific Periodical was effected, in order to increase its scope of usefulness as a medium for the publication of research work done by the members of the Agricultural Department in Madras.

Acknowledgements: It is now my pleasant duty to record our thanks to all those who have helped the Union during the year. To Dr. R. Nagan Gowda, the Union owes a deep debt of gratitude for inaugurating the last year's Conference and for presiding over the sessions of the symposium. To Sri M. S. Sivaraman, I. C. S., the Director of Agriculture, Madras, the Committee tenders its grateful thanks for the never-failing

help and guidance so freely given by him. To Sri P. D. Karunakar, ex-Principal, Agricultural College and Research Institute, Coimbatore and Principal, Agricultural College, Bapatla and Sri R. Balasubramanian, Principal, Agricultural College and Research Institute, Coimbatore, the Managing Committee offers its heart-felt thanks for their help in organising the College Day and Conference in 1952 and for their sustained interest in the welfare of the Union during the year. Our thanks are also due to all the ladies and gentlemen who helped the Union in conducting the College Day and Conference in 1952 and during the year under report.

S. Varisai Muhammad,
Secretary.

Dr. Punjabrao S. Deshmukh's Inaugural Address

Dr. Punjabrao S. Deshmukh (Minister for Agriculture, Government of India) stressed the need for agricultural organisations all over the country for correlating research and field work. Dr. Deshmukh, stressing the importance of agriculturists organising themselves said, that such organisations conducted not only to development of agriculture and greater production but also tended to ensure the social and political solidarity of the whole country. It would also give the country a right lead. India had been singularly fortunate in its leadership and Indian leadership had achieved wonders. But for Congress leadership and Congress organisation the country would not have achieved independence, liquidation of the princely order, abolition of the Jagirdari system and several other progressive measures.

Referring to the Five-Year Plan, the Minister said that it might be that they had to revise that plan and make it more dynamic and progressive but they had to remember the limitation under which the Plan had been drawn up. In the Plan the pride of place had been naturally given to agriculture. Education in agriculture, he said, had to be revised so that hankering after Government service ceased and students going out of agricultural colleges were in a better position to understand the farmer and his problems. There must be a two-way traffic between Agriculturists on the plough and men who did research work in institutions. It was this link that was lacking and the Ministry of Agriculture with the help of some international organisations was trying to establish this two-way traffic and if they succeeded in this both agriculture and the agriculturist stood to benefit. With this view, they had selected a few colleges where they wanted to start extension courses, attached to their ordinary courses so that there would be better contact between students and farmers in the field.

Land Tenure: Referring to land tenure and land legislation the Minister said that in many places they were going about it in a haphazard

manner so that legislation differed from place to place. Slogans and new ideas got currency at such a fast pace that very many people were nervous to voice their feelings against this current for fear of being dubbed reactionaries. From this point of view the need for an agricultural organisation was great. The landed gentry and peasants had yet to make their voices felt in administration especially of land and proprietorship of land in the country. He did not voice any disagreement with what the Planning Commission had decided or with whatever popular things were said by various leaders in the country. He would like the agriculturists themselves to view these policies calmly and express themselves in an organised manner.

Referring to Dr. Nagan Gowda, Dr. Deshmukh said that he had a practical knowledge of agriculture and in his going away from Madras they were going to suffer a great loss.

Speaking in his personal capacity Dr. Deshmukh said, he felt that there should be a larger number of research institutions and greater agricultural education. Lastly he said that Coimbatore with its many and varied technical and technological institutions was well fitted to have a University of its own. People in the South possessed intelligence and ability. They must eschew all feeling of North and South and think of the larger interests of India, which had become united after centuries of division. If there was any temporary lack of attention to the South, they must work and voice their demands in a peaceful manner. Whether it was food production, industrialisation or agriculture all of it was going to be pooled for the welfare of the country as a whole for which greater service and co-ordinated effort were needed above anything else.

Presidential Address by Dr. T. S. Venkataraman, D. Sc.

Problems in our Agriculture

Every Indian will admit that our country is today presenting problems for solution in every department of life, political, social, linguistic and others. Along with these our agriculture also presents a variety of problems, certain arising from those above mentioned. We have been complimented in the past for being a great agricultural country by agencies with perhaps an eye on exploiting our agricultural resources. We have taken it as a compliment and sometimes with a sense of pride. With the attainment of Independence, we have to realize the implications of this fact and utilise the resources to the full advancement of our country agriculturally—and what is equally important—industrially as well.

The Four Corner Posts of Agriculture: All agricultural work in any part of the world revolves around four factors which may be considered the corner stones in such work. These are (1) the agriculturist, (2) the land, (3) the crop, and (4) the agricultural produce and its

utilization. Sound agricultural progress requires co-ordinated work in all the four directions.

The Agricultural Worker: This class represents the largest, the most varied and perhaps also the most important unit of the four. I include in the term, the labourer with the spade, the man behind the plough, the landowner planning his crops and the members of the Agricultural Department, who both in the laboratory and the field carry on a constant struggle with the problems presented by the crops. My address this day will largely be to my colleagues in the profession, viz., the students of this and similar institutions and to the Government organization running our Agricultural departments.

The Missionary Zeal: In my musings, I have often wondered why missionary agriculturists have not come into being in our country of sadhus, mystics and bikshus. We all know the very valuable results from missionary societies working in our country in the field of education and medical and social services. If foreigners could voluntarily segregate themselves from their kith and kin for service in our country—may be with some other object as well—why our own youngsters, and perhaps some elders also, should not band themselves into agricultural service units. Service which is paid for is not generally as wholehearted as voluntary honorary service. It should be within the knowledge of you all that it was a monk, Gregor Mendel, working in his lonely cloisters that laid the foundations of modern plant-breeding and practically revolutionized agriculture by creating new varieties. If you feel such an urge, let not the old injunction from the Tahithiriya Upanishad that after completing your studies you should maintain unbroken the thread of your family by taking a wife, stand in the way. It was an excellent exhortation at that time when there was great need for more hands and brawn both for self-maintenance and for defence. This is unnecessary and out of place in the present times when the effort must be to lessen the number of mouths to be fed—shall I add by non-violent means? Our Nationals are today being hunted out of places like parts of Africa, whose prosperity they had helped to build up. To the researcher let me state categorically that research is a very jealous life-mate and does not tolerate other partners; bigamy is ruled out from experience though not yet by statute.

Bridging the gulf between the Researcher and the Agriculturist: Visiting scientists from foreign countries—after seeing the achievements at our experimental stations—have opined that at present there is no suitable bridge between them and the agriculturist and to this they have attributed the slow spread of recommended improvements. A closer examination will reveal that, in some cases at least, there were other difficulties in their adoption—may be want of financial or other equipment. When a recommendation is really good and outstandingly

so, the cultivator is sometimes not even cautious in adopting them. I know of sugarcane types that have been stolen from experiment stations, before the station itself could make up its mind about them—and these had subsequently to be bought back. The researcher has, therefore, to examine and perhaps re-inforce his improvement in certain directions before it could become easily popular.

Borrow to assimilate: It is usual and rightly so for the workers to borrow from outside new ideas and practices. For lasting benefits, however, these will need to be assimilated and in some cases suitably combined with our own. Towards the beginning of the present century we imported from outside countries sugarcane types which showed superior performance to our own in our fields but this was only for a time. It was not till we were able to hybridise them with our indigenous material that more lasting types were obtained; and these are now popular in other countries also with similar environmental conditions. The foreign importations had been evolved for and under a different set of conditions.

Compensating Factors for the Agriculturist working in Rural Parts: The town and its amenities have an attraction of their own but it is consoling to the rural worker to remember that town life has certain disadvantages due to overcrowding and the rather unhealthy atmosphere, in spite of all modern attempts at sanitation. Unlike your colleague in the town sweating in a crowded office—may be under a fan circulating the confined air—you have an environment in which you can bring up a few healthy and happy children. The value of this advantage cannot be measured in money value like many other assets to which the money standard cannot be applied.

Fill up all Government Departments with Agricultural men: This is an important occasion when representatives of both the Central and State Governments, agricultural workers of all classes—and what is more important—future members of our legislature with a few Agricultural Ministers among them are present. I cannot, therefore, resist the temptation of throwing a few suggestions for the better working of our Agricultural departments. My association with Agricultural departments for four decades perhaps gives me some right to do so. We have been rightly claiming that agriculture is our basic industry. Naturally agriculture enters for consideration—or ought to—in all our National problems. We are also spending considerable amounts in training our young men in that science. One fails to see why our Governments should not fill all their services with graduates from this or similar institutions or at least give all their officers adequate training in the basic principles of agriculture. Tone up the teaching where necessary, create greater facilities where such are lacking but ensure that agricultural knowledge permeates the whole of our administration. Our Irrigation engineers, for instance,

should learn the basic water needs of our crops and the time they need them most. Some time back I happened to be in the Tanjore delta with certain paddy fields ready for harvest and shedding their grains. Harvest was, however, impossible as the branches of the river Cauvery on either side were flowing full. When I interviewed the Executive Engineer and explained the situation, he quickly understood and remedied the position within a few hours. We unfortunately lost this Engineer in the Krishna anicut disaster. Other engineers may not be so understanding and responsive—sometimes at least they are not. There can be little doubt about the utility of agricultural knowledge in the officers of the Revenue Department as this department collects taxes on our crops.

Why change his work for adequately paying a deserving officer: One of the major drawbacks in the present working of our Agricultural departments in the veiled belief that administrative posts need to be paid much higher than research posts and the wide differences in salaries between research posts in allied sciences. This leads to the researcher looking out for chances to improve his prospects by changing his line of work or applying for administrative posts. This is inimical to research and truncates its development. The relatively higher-paid posts advertised by temporary organizations whose lives often get extended from time to time is adding to the confusion. If a Researcher is found deserving of promotion and is found to do useful work at his post, all promotions must come to him and at his own post so that his usefulness can be continued. I know of quite a few who have thus been lost to research, and researchers are yet not too many in our country.

Do not kill Science by overburdening with administration: Research is a delicate plant and knows no hours or routine. Administration, on the other hand, is amenable to fixed hours and routine is its strong point. When you saddle a researcher with administration, you get indifferent research and worse administration. It has also been usual for Departments to add to the duties of a researcher some administration work with an allowance for it. This results in the department getting only the value of the allowance and almost nothing for the basic pay of the scientist.

Deal with Agricultural Problems as Whole Problems: All agricultural problems have to be treated as whole units though they present many facets to the investigator and involve the help of more than one branch of science. The Breeder, for instance, should follow his strains from the time of their birth at his station, through the characteristics displayed by them in the cultivator's fields and till they reach the consumer and his reactions to it. The Howards have blazoned the way for us. They followed their wheat strains into the English bakeries to watch how their flour behaved in loaf making. While it is not possible to

master all the branches of science involved, the Breeder should pick up an elementary knowledge of the various processes through which his new type has to pass to the consumer. This applies to other agricultural workers as well.

What problems to tackle: Some discrimination is also necessary for selecting the problems for study and investigation. Some years back, I desired to know from one of our nutritional institutions if they had studied the changes—advantages and disadvantages—taking place in the kept cold foods of our agricultural labourers. Sharp came the reply that this work has not been done and is not also in their programme. Are the food habits of the larger number of our countrymen not important enough to demand attention? Some of us might also remember the claim made by another Nutritional Institute about their being near the production of a synthetic drink which would contain all the useful ingredients of betel chewing. Betel chewing is a social habit and a small pill to be quickly gulped down will never be an appropriate substitute. With the great impetus now being given to increase paddy yields, there should be a corresponding lowering of tempo in the production of synthetic rice.

Problems beyond the scope of the present address: There are other very complicated and difficult problems associated with land holdings and their tenures, relationship between the landowner and the tenant, the crops to be grown in a particular region and in what quantity and the commercial end product and its disposal but these are beyond the scope of this address.

A message: Before I conclude I wish to give a special message of hope to my fellow workers. Though the problems to be tackled are thus many and obviously difficult, I can see a silver lining in the horizon for you all and the conditions would appear to be favourable for this line to spread itself out into an effulgence. The factors favourable for this effulgence are: (1) Self-Government which has conferred on us the privilege, the right and the duty to serve our country by ordering our home in our own way without interference from others, (2) the key posts in our Governments being filled by our own Nationals who have no equals in their good intentions and their sincerity, (3) the great river-control projects which are steadily taking shape so as to secure to us most of our available waters and water is 75 per cent of agricultural progress, if rightly used, and (4) the apparently inexhaustible agricultural wealth of our country which tempted many a foreign nation in the olden days to risk their lives and fortunes to reach them. The students of this and similar Institutions are the torch bearers in the vanguard of the laboratory-cum-field army sworn to give us independence in the necessities of life without which the political independence we are now enjoying loses much of its value.

Vote of thanks by Sri R. Balasubramaniam, Principal

As the Principal of the institution and the President of the Madras Agricultural Students' Union, it is now my pleasant task to propose a vote of thanks. We are very grateful to Dr. P. S. Deshmukh, Minister for Agriculture, Government of India for having accepted our invitation to inaugurate the 36th College Day and Conference and to distribute the prizes to students. We are at the same time sorry that, on account of other engagements he is unable to be present and to participate in the Conference on 18th and 19th instant. We, however, hope that in the short time allotted for his visit to the exhibitions arranged in the various Research Sections at the Agricultural College and Research Institute, we will be in a position to explain both the achievements of each section and the broad outline of the immensity of problems on hand.

The Union is deeply indebted to Dr. Nagan Gowda, Minister for Agriculture, Madras for his abiding interest in the affairs of the Madras Agricultural Students' Union and the continued help given to it. We owe the inauguration of the College Day and Conference by the Union Minister, to his efforts and personal influence. We are singularly fortunate in having Dr. T. S. Venkataraman, a distinguished Scientist, as the President of today's Celebrations. He is one of the band of early workers who gave their best to the Union and strove to build it up. Our thanks are particularly due to the Director of Agriculture, who evinces a missionary zeal and interest in all matters pertaining to agriculture but for whose sympathy, help and advice, the Madras Agricultural Students' Union would not have been in a position to celebrate the function in the style and manner befitting the best traditions of the Union and the Department.

Agricultural Education in Madras State continues to be popular and to attract more and more of young students. The first year B. sc., (Ag.) class is full with a strength of 96 students and has commenced to work from 21st July 1953. Forty-eight out of Fifty six students who appeared in the final examinations held in April 1953, came out successful. Most of them have since been absorbed in the Department. The post graduate course of Diploma in Horticulture run by the Department until recently has been affiliated to the Madras University. The batch of students admitted on 14th August 1953 will be the first to come under the new regulations. A short course for the young farmers was also instituted from 1st July 1953 for giving a comprehensive training in scientific agriculture with greater emphasis on practical aspects. Eleven young men have joined the course. At the end of the training, they will go back to their land and utilise their knowledge in increasing production.

The present session is unique in many respects. It is perhaps the last of the celebrations under the undivided Madras State. The

impending partition may divide the State and divide the services but I am sure that the Madras Agricultural Students' Union will continue to keep alive the many ties of friendship and spirit of comradeship that were built up through the healthy traditions of the Union in the past. It is the one link which will continue to bind the future graduates of the two Agricultural Colleges, the services and the farmers of the two States after division.

Nature has been more generous than what it had been during the last half a dozen years in the matter of rainfall and water stored for irrigation in river projects. On account of failing and erratic monsoons, the acreage planted and cropped as well as the levels of yields were affected and lowered. The fruits of research obtained by the workers in the Department could not therefore be put into large scale extension and increased production. The year augurs well and let us strive to put our whole energy and scientific knowledge in stepping up production in order that our glorious traditions as a land of plenty may be revived and instead of being dependant on imports for our full meal, we may earmark surpluses for helping our brother nations in times of need.

Let me in conclusion once again thank all those who have helped the Union and who have contributed to the success of today's function.

**Symposium on "Agriculture Department and its contribution to the
Agricultural Prosperity of the Madras State" — Opening of
Symposium by Sri M. S. Sivaraman, I. C. S.,
Director of Agriculture, Madras.**

Sri M. S. Sivaraman, Director of Agriculture, initiated a discussion on "Agricultural Department, and its contribution to the agricultural prosperity of Madras State." on the 19th morning.

Sri Sivaraman said the Madras Agricultural Department was first organised as part of the Revenue Department in 1871, and reorganised in 1906 as a separate Department. In the 80 years of its existence, a good deal of research work pertaining to agronomy, plant breeding, plant pathology, plant introduction and soil science had been done, and it had tackled some of the fundamental and local problems of tropical agriculture. The results of research had been spread to the fields of the cultivators to some extent, and this had naturally been reflected in the growing agricultural welfare of the State.

Major contributions: He cited the following as the major contributions of the Department:

1. Evolution and spread of American varieties of long staple cotton, which has earned for Madras the foremost place among the cotton-growing States of India.

2. Spread of groundnut to new areas in the State, which has resulted in an increase in the area from 72,000 acres in 1882 to over 45,00,000 acres.

3. Spread of improved varieties of sugarcane bred at Coimbatore, which has enabled Madras to be nearly self-sufficient in sugar, and surplus in jaggery.

4. Spread of Virginia tobacco, which adds nearly Rs. 8 crores of foreign exchange.

5. Evolution of blast resistant and other strains of paddy to suit the requirements of nearly 80 per cent of the paddy areas; and

6. Evolution of other improved seeds and plant materials.

He said: Our past achievements are no doubt great, and on a rough estimate will be over a third of the present annual agricultural production of Rs. 540 crores. But greater things have yet to be achieved in order to ensure the maximum economic exploitation of our natural resources and manpower.

Three stages: "There had been three definite stages in the growth and development of the Department. In the first 50 years of its existence, the Department was mainly concerned with the testing of local agronomic practices to find out how far they are scientifically sound, and the adaptation or alteration of these methods to ensure greater production. This period coincided with the expansion of the area under cultivation till it reached its highest level by about the end of World War I.

"The second stage was the period between the two wars when special attention was paid to the development of improved strains by selection and hybridisation as the main approach to the problem of increasing production to keep pace with the increase of population. The third stage began with the start of World War II, when an integrated approach was made to improve agricultural production by paying special attention not merely to improved seeds, but also to improved agronomy, manuring, irrigation, plant protection, marketing, and all other relevant factors.

Drawbacks: "The Second World War has helped to impress upon us some of the main drawbacks of our agricultural economy. These are, firstly the cropped area in the State has been nearly constant during the last 30 years, while the population has gone up by 40 per cent. Secondly, the cereal production has gone down, and there has been a steady decline in the average output per acre of some of the important crops like paddy, groundnut and sugarcane. Thirdly, the total manurial resources have not improved appreciably in spite of much larger use of fertilisers, with the result that the genetic potentialities of improved seeds are not fully availed of to improve production. The result has been, reduced per capita production, particularly of cereals, increasing dependance on cheaper forms of food energy like carbohydrates, and greater difficulty in

producing protective foods such as milk, eggs, and meat, as all area useful for profitable cultivation is already cultivated.

"How then with a stationary area under cultivation are we going to produce protective foods to improve the nutritional standard when such protective foods require a large area for production, and at the same time supply the raw materials required for our rising industrial activities? This in short is the problem which the Department has to solve, and the activities of research and extension workers have therefore to be canalised towards increasing agricultural production through methods and devices which can be adopted by the cultivators without any great extra burden even in the existing economic set-up. No cultivator will adopt any method, however desirable it may be from the scientific point of view, if it ultimately lands him in loss.

Profitable cultivation: "One of the ways of inducing the cultivator to adopt what the Department preaches is therefore to show that the Departmental farms are themselves run as models of profitable cultivation. In my efforts in this direction, the expenditure of Government farms has been reduced by Rs. 47,000/-, and the income has gone up by Rs. 1.99 lakhs during the last year, a saving of nearly Rs. 2½ lakhs out of a budget of Rs. 10 lakhs. At the same time, we are harping on the need for demonstrating in every one of the farms the possibility of producing the manurial requirements of fields along the margins without detriments to the growing crop. We are also developing double cropping and utilising the summer fallows in paddy areas for raising a crop of groundnut or cotton with the help of filter points and borings. Thus the entire machinery of the Department is geared to achieve this goal of improved production through simple and inexpensive devices.

"Every one of the scientific and extension workers will no doubt have a lot to say about the achievements of the Department in his particular sphere of work. In the course of the discussion on the subject for this year, I should like you to confine yourself to measures, which are capable of being followed by the cultivator in his present local environment. What the country now requires is not scientific agriculture as such, but a practical approach to scientific agriculture."

LIST OF PAPERS RECEIVED FOR THE 36TH COLLEGE DAY AND CONFERENCE, 1953.

SUBJECT	NAME
1. Contribution of the Mycology Section of the Madras Agricultural Department to the agricultural prosperity of the Madras State.	Sri T. S. Ramakrishna Iyer.

SUBJECT	NAME
2. The Paddy Section and its contribution to the prosperity of the State. Review and summary of Rice work for four decades.	Sri A. Abdul Samad.
3. The Entomology Section in the Agricultural Department and its contribution to the agricultural prosperity of the Madras State.	Sri V. Tirumal Rao.
4. Improved strains of Millets — Their contribution to the agricultural prosperity of the Madras State.	Sri M. A. Sankara Iyer, ,, P. Krishnaswamy.
5. How the Chemistry Section of the Agricultural Research Institute, Coimbatore is helping the Farmer.	Sri M. Sanyasi Raju.
6. Agricultural Department—its contribution to the prosperity of Araku Valley	Sri G. V. Ratnam, ,, M. V. Somayajulu, ,, K. A. N. Raju, ,, D. N. M. Raju, ,, J. A. Narasimhan, ,, S. V. Ananthacharlu.
7. Contribution of the Oil Seeds Section to the agricultural advancement of the Madras State.	Sri C. R. Seshadri.
8. Five decades in Sugarcane Research.	Sri S. V. Parthasarathy.
9. Agricultural Extension service and its contribution to the agricultural prosperity of the Madras State.	Sri N. Ranganathachari.
10. The contribution of the Madras Agricultural Department in the improvements of fodder grasses and legumes.	Sri C. Rajasekhara Mudaliar, ,, Daniel Sundara Raj.
11. Production of Hybrid Cumbu seed and its contribution to the agricultural prosperity of the Madras State	Sri A. Kunhikoran Nambiar, ,, P. Madhava Menon, ,, P. Krishnaswami.
12. Agricultural Department and its contribution to the agricultural prosperity to the Madras State	Sri C. Balasubramanian.

SUBJECT	NAME
13. Agricultural Department and its contribution to the horticultural prosperity of the Agency Tracts of the Madras State	Sri M. V. Somayajulu.
14. Maximisation of production—Part II—More paddy in the Godavari and in Krishna Districts with the under-ground water-shed.	Sri M. Satyanarayana.
15. The Agricultural Department and its contribution to the agricultural prosperity of the Madras State.	Sri M. A. Balasubramanian, ,, R. Gopalakrishnan.
16. The role of rural industries in the agricultural prosperity of the State	Sri S. A. Ebrahim Ali.
17. Pulses Section. Its contribution to the agricultural prosperity of the Madras State.	Sri M. A. Sankara Iyer, ,, V. Srinivasan.
18. Cambodia cotton research in Madras. How it has contributed to the agricultural prosperity of the Madras State.	Sri K. Kannyan.
19. Agricultural Research Station, Nanjanad, its contribution to the prosperity of the Nilgiri Estate Farmer.	Sri M. D. Azariah ,, Saptharishi.
20. Agricultural Department and its contribution to the agricultural prosperity of the Madras State with special reference to cotton production	Sri C. Jagannatha Rao, ,, N. Kesava Iyengar.
21. The contribution of the Ground-nut Breeder to the prosperity of the Madras State.	Sri S. Varisai Muhammad.
22. Role of Departmental varieties in the Sugarcane Industries in Bobbili.	Sri Gona Rama Rao.
23. Anakapalle Sugarcane Research Station—Its contribution to the prosperity of the Madras State.	Sri B. L. Narasimhamurthy.
24. The Agricultural Department and agricultural prosperity.	Sri T. B. Dasarathy.

SUBJECT	NAME
25. Our vernacular agricultural journals and their contributions to the agricultural welfare of the Madras State.	Sri G. Satyanarayana.
26. Contribution of agricultural research to the coconut industry in the State.	Sri S. G. Aiyadurai.
27. The prosperous Sugarcane.	Sri S. V. Parthasarathy
28. Sugarcane development in Madras State and the part played by the Agricultural Department.	Sri C. Ekambaram.

Farmers' Day Celebrations

The fourth Farmers' Day Celebrations, arranged by the Superintendent, Central Farm, Coimbatore, commenced with a welcome speech delivered by the Principal, Agricultural College and Research Institute, Coimbatore, on the 18th morning.

Welcome Speech by Sri R. Balasubramaniam

We are meeting here to celebrate the Fourth Farmers' day. I welcome all the farmers, the officers and the students who are assembled for the celebration. This is the only occasion when the Department and the farmers meet and assess the contributions of each. I request the visitors to go round the exhibits, the wet and dry lands cropped with green manure plants, and to discuss their individual problems with the officers of the Department. The purpose of the celebrations would be well served, if the visitors could be induced to adopt the several recommendations made and to increase the national production. Messrs. Stanes and Company would be demonstrating the use of a 'rotovator' for incorporating green leaf manure in soil.

The Central Farm was started in the year 1909, for imparting instructions in practical agriculture to the students and for carrying research work on crops, soils and cultivation. Since the intensification of research on crops and soils by the several scientific sections which were opened later, the Central Farm etc. Since the intensification of research on crops and soils, by the several scientific sections which were opened later the Central Farm concentrated her work on agronomic problems and the multiplication of improved seeds of paddy, millets, cotton and oil seeds for distribution to the ryots in the neighbourhood. The various achievements of the farm and the general recommendations made for increasing the yield of crops and income of the farmers in Coimbatore district comprise the following items which are also exhibited to-day.

1. The trial of various greenmanure crops in wet lands has demonstrated beyond any doubt that the maximum profits are obtained by applying green leaf at 4,000 to 5,000 lbs. per acre of paddy grown under wet conditions and among the various green manure plants, *Sesbania speciosa* and *Glyricidia maculata* are the best in all respects. The former can be grown as a catch crop between two crops of paddy and the latter on the bunds of paddy fields.

2. The use of labour saving implements increases your nett profits for a given gross income. It pays a farmer to own them in the long run.

3. Among the fodder grasses tried under ordinary and sullage irrigation, guinea grass with an yield of 1,00,000 lb. per acre per year was the best.

4. Blast resistant strains of paddy, quality cottons in cambodia and Karunganni and varieties of other crops evolved by the crop specialists yield the highest under all conditions and give the maximum return per acre. Even a small impurity of ten percent reduces the profits. Hence periodical renewal of seeds from the Agricultural Depôts is not only advisable but necessary.

I am extremely grateful to Dr. Nagan Gowda, Minister for Agriculture, Madras for having accepted the invitation to inaugurate the Farmers' day and take part in to-days celebrations amidst his numerous other engagements. Being himself an experienced farmer, we may look forward to his advice and guidance.

Dr. R. Nagan Gowda, Minister for Agriculture, Madras, inaugurated the celebrations by referring to the significance of the celebrations of the farmers' day. In his address he congratulated the officers responsible for the noteworthy achievements of the Central Farm, Coimbatore.

Dr. Punjabrao S. Deshmukh gave a special address to the farmers, which was recorded by A. I. R., Tiruchi, for broadcasting. He laid stress on the need for healthy organisations among farmers and said that their interests could be well protected only through these organisations.

The Editor of a local agricultural journal and Sri V. C. Subbiah Gounder spoke a few words on the working of the Madras Agricultural Department.

The function came to a close by the visitor's going round the exhibition specially arranged for the occasion.

General Body Meeting

The annual general body meeting of the M. A. S. U. was held on Thursday, 20th August 1953 at 3 P. M. with Sri R. Balasubramaniam ex-officio President in the chair.

After the presentation and adoption of the minutes of the previous General Body Meeting, Annual Report and Auditors' report the following office-bearers were elected for the year 1953—1954.

Sri R. Balasubramaniam President (Ex-officio-President)
Sri M. R., Balakrishnan (Vice-President)
Dr. N. Krishnaswamy (Editor)
Dr. A. Mariakulandai (Secretary)
Sri T. V. Subramanian, Manager.
Sri M. V. Jayaraman, Treasurer.

The members of the Council, both residential and mofussil, managing committee and Editorial Board were duly elected.

The meeting came to an end with a vote of thanks to the retiring committee proposed by Sri S. M. Kalyanaraman and unanimously adopted by the house.

Report of the Managing Committee for the year 1952—'53

The Managing Committee presents the following report of the activities of the Union for the year 1952—1953.

Membership: The strength of the Union as it stood on the 31st July 1953 was 1458 as against 992 of last year consisting of 888 officer members, 230 student members and 319 subscribers and the remaining 21 made up of Patrons. The membership of the Bapatla College students has not improved this year too. The intensive membership campaign launched by the enthusiastic members of the Madras Agricultural Students' Union has brought a good addition of 466 members to the Madras Agricultural Students' Union this year. This is indeed a remarkable achievement and the Managing Committee takes this opportunity to thank one and all particularly Sri M. Kanti Raj who were concerned with this campaign. The Committee also appeals to all Officers who are not members of the Union yet to enrol themselves as members and help the Union.

Office Bearers: Sri C. R. Venkataraman resigned the Manager's post and Sri K. Meenakshisundaram was co-opted in his place. Sri A. Abdul Samad was co-opted as a member of the Editorial Board in the place of Sri T. R. Narayanan resigned.

Meetings: During the year the Managing Committee met 13 times to transact the routine items of business.

Madras Agricultural Journal: The Journal continued to be published regularly and promptly. The Editorial Board met 9 times during the year to select articles for publication. A large number of articles were received during the year and the Editorial Board regrets that it could not publish

all the articles received in time owing to pressure of space. During this year the difficulty was all the more felt as the papers received for the symposium held during the College Day and Conference in the year 1952 could not be published in a single volume as a Special Number for want of special grant from the Government. The symposium papers were published monthly, distributed over four numbers. The Editorial Board has also published a Special New Year number with the articles received from those who have the development of scientific Agriculture in the country as the foremost in their minds and with the greetings and best wishes from Sri C. Rajagopalachari, the Chief Minister of Madras and Sir C. P. Ramaswamy Iyer. The Committee takes this opportunity of placing on record its gratitude to the members of the Editorial Board and the Editor Sri C. Balasubramanian.

Finance: The financial position of the Union is not as flourishing as it should be. The Committee records its gratitude to the Government of Madras for the subsidy of Rs. 1,800/-. The Committee is also thankful to to all those who contributed donations towards the celebrations of the College Day and Conference.

Ramasastrulu Muuagala Prize: Five papers were received for consideration for the above prize. The papers were valued by a Committee of Judges nominated for the purpose. The paper entitled, "Studies on dormancy in short term rices", was awarded the prize. The Committee offers its congratulations to Sri A. Shanmugasundaram, Assistant in paddy, Agricultural College and Research Institute, Coimbatore, the winner of the prize. The Committee also offers its heart felt thanks to Messrs. M. Kanti Raj, T. Nataraj and T. R. Narayanan for having kindly accepted to act as Judges in this year's competition.

Acknowledgment: The Committee thanks the members of the Union for the unstinting help they have given in successfully conducting the activities of the Union. Our thanks are due to Sri P. D. Karunakar and Sri R. Balasubramanian, Principals, Agricultural College, Bapatla and Coimbatore respectively for their keen and sustained interest, sympathetic attitude and advice in all matters connected with the Union. We have great pleasure in recording our thanks to the convenors and members of the various committees for their whole hearted co-operation and help in the celebration of the College Day and Conference.

S. Varisai Muhammad,
Secretary.

Research Notes

Hairy Vetch (*Vicia Villosa*) A Promising New Introduction

A very small quantity of seeds of the Hairy Vetch (*Vicia Villosa*), of American origin, was received through Sri C. P. Bhimaya, Assistant Conservator of Forests (Soil Conservation), from the office of the Provincial Sylviculturist, Ooty, during April, 1952. The seeds numbering twenty, were raised on a small bed (2'x2') and recorded good germination, only three failing to sprout.

After establishment, the plants grew up vigorously, with profuse branching and, within two months, afforded a very thick cover to the soil over an extent of 100 square feet. Flowering started six months after sowing and though the early-formed flowers shed off, successful setting of pods and seed is now noticed. The seeds are being collected for further multiplication and spread.

The stems, which are stringy, rapidly straggle along the ground and the overlaying branches and leaves have formed a thick canopy over the soil. The seedlings were watered only up their stage of establishment and, in spite of the big deficit in the monsoon rains, no check in progress of growth was observed. When ten lb. of the green matter were cut and fed to cattle, it was found that it was much relished. The cut plants developed new shoots quickly.

As could be observed so far, the crop was not cut by heavy ground frost which occurred for a total period of 30 days. It may therefore be concluded that, the crop is able to withstand both a prolonged dry spell and very cold conditions. It is reported that in the State of Oklahoma, U. S. A., the Hairy Vetch is an important forage and cover crop.

Agri. Research Station, }
Nanjanad.

K. SAPTHARISHI,
K. RADHAKRISHNA ALWA.

A Short Note on *Striga Euphrasioides* Benth on Paddy and its Control

This year fairly heavy attack of *Striga* was noticed on paddy in Podili taluk in the Nellore district. The paddy is irrigated from tanks. Over 5% of the area was reported to be infested. The attack was patchy, located more or less near bunds or channels and severe within the patches. Paddy growth was considerably affected in these patches. Within the patches examined, the paddy was found stunted with an average height of about 1' 3" the maximum height of the *striga* noted being 1' 8". The paddy crop looked smothered with a very poor stand. The ryots say that *striga* occurs in that area when drought conditions are prevalent in the early stages.

The parasite concerned is *striga euphrasioides* (identified by the Government Systematic and Lecturing Botanist). This species was noted by Tadulingam and Venkatanarayana (1) on crops like Ragi, Sugarcane and Cholam besides paddy under swampy conditions. Uttaman (2) has recorded *Striga lutea* on paddy in Malabar district (*Striga euphrasioides* differs from *Striga lutea* in having 15 ribs on the calyx all the ribs being continued to the apex of the calyx lobes. The seeds are more elongate than those of *Striga lutea*). (Tadulingam and Venkatanarayana)

Fernoxone, containing 80% of 2:4-D (2:4-dichlorophenoxy acetic acid) was sprayed in two strengths in a field in Podili village for control of this parasite, the strengths being 1 oz. in 2 gallons and 1 oz. in 5 gallons of water. Both the

strengths were very effective and paddy was unaffected. No difference was noticed between the effect of the two strengths. On the third day wilting and discoloration was observed especially in the growing regions. After 7 days the parasites had completely wilted and never recovered later.

Spraying Fernoxone at 1 oz. in 5 gallons of water is quite economical. At the present concessional price allowed for food crops the cost of chemical required per acre works out to Rs. 6—6—6 as given below.

Dose of Fernoxone is 1 oz. in 5 gallons of water.

Rate of spraying 200 gallons per acre

Chemical required is $2\frac{1}{2}$ lbs. per acre

At Rs. 2—9—0 per pound cost of chemical is Rs. 6—6—6.

(Rs. 5—2—0 is the actual cost per pound of Fernoxone. But the Government allows half concession for food crops. Hence the cost is calculated at Rs. 2—9—0 per lb.)

Since the incidence of Striga is generally in patches the cost of the chemical will work out to less than the above amount and may not be more than Rs. 4—0—0 per acre of crop. As the ryots own only small acrages no separate labour need be employed for spraying.

Treated sufficiently early this treatment will save considerable quantities of food grains in the areas affected.

BIBLIOGRAPHY

(1) A hand book of some South Indian Weeds by C. Tadulingam and G. Venkatanarayana.

(2) Parasitism of *Striga lutea* (Lour) on Rice and methods to protect rice plant against *Striga* by P. Uttaman. The Madras Agricultural Journal Vol. XXXVII. No. 3.

Plant Protection Office,
Bapatla.

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P. GOVINDARAO,
M. NARASIMHARAO,
C. APPAVU NAIDU,

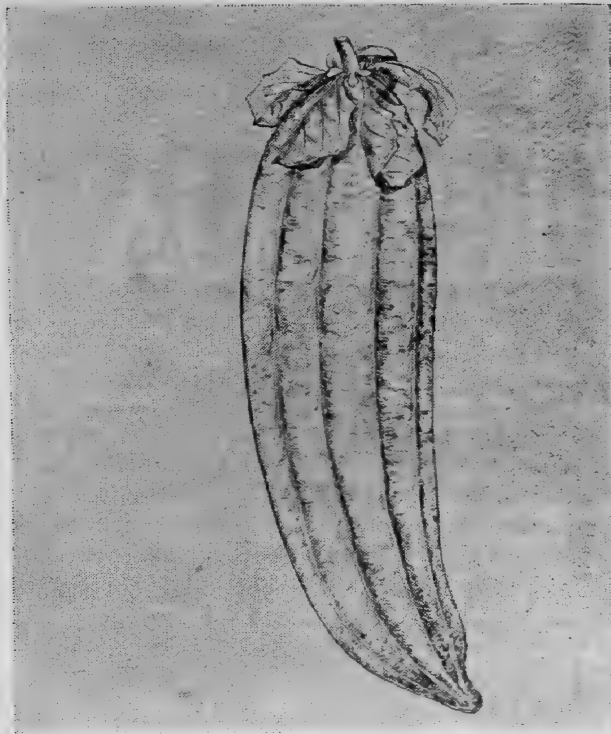
Occurrence of Phyllody in the Calyx of *Luffa Acutangula* Roxb

Phyllody includes those cases in which sepals become foliaceous.

As quoted by W. C. Worsdell (1916), Prantle (1887); Velenovesky (1900) and Goebel (1906) and others hold that the calyx is phylogenetically bracteal in origin, a view derived from the fact that the calyx is usually green and leaflike and often differs from the corolla in displaying a spiral arrangement of its sepals. Velenovesky (1900) brings forward the examples of *Camellia* to show that sepals here belong to same spiral series as the numerous bracts below them and therefore must have derived from them.

Masters (1901) describes the occurrence of secondary flowers in the axile of both the displaced and the normally situated sepals of the cucumber which were foliaceous and he records also the occurrence of tertiary flowers in the axils of such flowers.

Worsdell (1903) records the metamorphosis of the pappus of the florets into two to eight narrow leaves in "*Helinum autumnale*" belonging to compositae.



Phyllody in *Luffa acutangula* Roxb

Singh (1928) has recorded a case of Phyllody in *Helianthus annuus*, L. where an abnormal capitulum in which 7 leaf like structures looking like involucre bracts were borne in the axil of a chaffy bract. He regards this as homologous to the habitually nearly abortive sepals and attributes it to physiological causes. The same author (1930 and 1935) records the transformation of petals, stamens and gynoecium (not the sepals) into leaves in *Trifolium alexanderinum* Linn and the transformation of sepals into leafy structures in *Gossypium indicum* var *malvensis*.

In January 1951, two primary fruits of *Luffa acutangula* Roxb. were observed to possess big foliaceous accrescent sepals. This appears to be a case of Phyllody in the calyx. As far as the authors could see it appears to be the first time a case of Phyllody in the sepals of *Luffa acutangula* Roxb. is being recorded. The reasons for such transformations are not exactly known. It may be due to physiological causes or due to insect interference very early in the development of those parts.

Botany Section
Agricultural Research Institute
Lawley Road P. O. Coimbatore

RAJASEKARA MUDALIAR,
GIRIJA LAKSHMAN.

Twenty-fourth Annual Report of the Agricultural Upper Subordinates' Association, Coimbatore

(The Association was recognised in G. O. No. Ms. 831 dated 8-8-1929)

The report for the period 1952 - '53 is presented as follows :

The Office Bearers for the period under report were,

Sri K. Kuppamuthu	..	President
„ N. Ranganathachari	..	Secretary
„ D. M. Samuel	..	Treasurer
„ K. Meenakshisundaram	..	Member
„ S. Varisai Muhammad	..	„

The Association continued to serve the cause of the members by representing to the authorities the needs of the Upper Subordinates as they occurred and repeating such of those requests already made but not so far favourably considered. Once again the Association reaffirms its readiness to help its members whenever it is called upon to do so, but in return all that is expected is enrolment of more and more Upper Subordinates who are still not in its fold. So that its hands may be strengthened and its voice heard better by the authorities.

Membership: The list of members has been brought up to date deleting those who had retired, resigned, deceased and who have been confirmed in the Gazetted Service.

The membership now stands at 362. During the year 18 new members have been enrolled thus bringing the total to 380. Let me draw your attention to the fact that according to latest figures available there 1,053 Upper Subordinates in the department distributed as follows :

		<i>Permanent</i>	<i>Temporary</i>	<i>Total</i>
Research Section	..	145	162	307
General Section	..	350	396	746
Total	..	495	558	
Grand Total	..			1,053

You will therefore appreciate the urgency and necessity for joining the association immediately having noticed the small number who are in the rolls and the majority of the Upper Subordinates who are yet to join.

I take this opportunity of appealing to every Upper Subordinate to co-operate by enrolling himself as a member of the association. Slender finances at the disposal of the association render it not possible to correspond with individual Upper Subordinate in this matter.

Meetings: There were two meetings of the Executive Committee during the year to draft the resolutions passed during the General Body meeting and to discuss the arrangements for the ensuing General Body meeting.

Business transacted: A number of subjects were represented to the authorities. Some of them were new and others were those already moved but not favourably considered. The Director of Agriculture, Madras was addressed on the following subjects :

1 To discontinue the practice of obtaining a bond executed by the Departmental Subordinates who undergo the D. I. H. course. Drawing his attention to the fact that no bond is insisted upon persons undertaking other courses, such as Agricultural Engineering, Associateship of the I. A. R. I. etc.

The Director of Agriculture has replied that the present arrangement will continue till the Diploma course is started by the Madras University and the analogy of other course will not hold good.

2. To instruct the controlling officers to communicate to their subordinates both curable and incurable adverse remarks.

The Director of Agriculture has informed that once again the officers are being instructed to communicate adverse remarks immediately.

3. To consider Senior Upper Subordinates from the general line for the posts of Secretaries to Market Committees irrespective of their service in the Marketing Section of this Department. The association is informed that this subject is separately under the consideration of the Government and no action is proposed to be taken pending their decision.

4. To depute one or two Upper Subordinates from each district in rotation to attend the Annual College Day and Conference held at Coimbatore.

The Director of Agriculture has informed that he does not consider it necessary to allow non-gazetted officers to attend the College Day and Conference.

5. The acute house shortage for the Upper Subordinates and the high rents prevailing outside the estate were represented. Relief measures suggested were, to gradually build more houses, enhance the house rent allowance to subordinates from Rs. 12/- to Rs. 25/- and release the A. B. and C types of quarters at present occupied by the Gazetted Officers to the Upper Subordinates.

The Director of Agriculture replied that the question of building more houses will be considered; enhancement of house rent allowance not possible; and he arranged to place all the A, B and C types of houses at the disposal of the Subordinates.

The Government was addressed on the following subjects:

1. To allow Upper Subordinates who have put in 5 years and more service to take up foreign service granting leave in the Department.

2. To review the promotions to Gazetted Services effected since 1945 as a number of seniors have been overlooked for no fault of theirs and reasons not known to them and redress the grievances.

3. To maintain the parity in Gazetted and non-Gazetted posts in the general and research sections; the present ratio of gazetted to non-gazetted staff in the research sections is about 1 : 3 while in the general section it is nearly 1 : 11.5. Measures suggested to remedy this to some extent were (a) stoppage of direct recruitment (b) diversion of the posts extension in nature, but held by research officers to the general section (c) strengthening the extension wing of the department.

Reply has not so far been received and the Government have been reminded.

Besides the above, for the information of the members let me briefly mention the items to which the attention of the authorities has already been drawn in the recent past and which are in various stages of implementation. Some of the requests have received partial acceptance while others have met with total rejection.

The Director of Agriculture was requested to arrange for writing off heavy stocks of unservicable articles in the agricultural depots and on the farms so that the responsibility of the persons in charge may be relieved to some extent. Fresh circular has been issued by the Director of Agriculture in this matter to write off the unservicable articles.

On a representation by the Agricultural staff working in the Community Project at Mangalore regarding their service under Assistant Project Officers who were equal in status to them but from other departments, the Joint Director of Agriculture was interviewed who promised to take necessary action with the authorities concerned.

Requests regarding enhancement of Daily Allowance to Rs. 3/- and corresponding increase in the F. T. A. of subordinates, restoration of travelling allowance rules to pre-1949 stage, restoring old maximum of Rs. 250/- to Upper Subordinates, granting dearness allowance on a par with Central Government servants, stopping direct recruitment to Gazetted posts etc., were rejected.

Stoppage of recruiting arts graduates into the department excepting those with First Class B. sc., or B. sc. (Hons) or M. sc., was accepted by the Government.

The circular regarding preparing seniority list in the sections excluding earned leave taken, was referred to the Government detailing the adverse effect it produced on the Upper Subordinates. As a result of that, leave upto three months was allowed to be included towards service in the section and it was clarified that the statutory seniority alone will be considered for promotion.

The confirmation long over due among the upper subordinates with service upto 14 years was brought to the notice of the Government and 240 persons have been recently confirmed besides the 91 who were confirmed on a previous occasion. Request for counting their services from the commencement of probation for purposes of pension was declined.

To a request from the Association that Agricultural graduates may be considered for the posts that may arise on implementing the Agricultural Income Tax Bill, crop Insurance Act and the Minimum Wages Act, the Government were pleased to refer those to the Departments concerned and the Association has been asked to represent these points at the appropriate time.

The above narration briefly indicates the various aspects in which the Association has been functioning for the betterment of the upper subordinates. I take this opportunity to thank on behalf of the Association the Director of Agriculture and the Government for sympathetic view they have taken in respect of our representations and ask for conferring more benefits on this deserving class of workers in future. We will be failing in our duty if we do not gratefully acknowledge the "Educational Concession" to the children of the non-gazetted officers and the "medical concession" to the subordinates and their family implemented by the Government.

May the Government continue to shower its gifts on its servants and the services in turn give their best in the discharge of their responsibilities.

My thanks are due to the members of the Executive Committee and other members of the Association for their unstinted help and co-operation extended to me in my functions as Secretary.

I thank the Auditors for having so kindly audited the accounts of the Association. I thank the Agronomist and Professor of Agriculture for having kindly permitted the use of Agricultural Hall for conducting the meeting.

N. RANGANATHACHARI,
Secretary.

Weather Review — For the month of July 1953.

RAINFALL DATA

Division	Station	Total rainfall for the month in inches.	Departure from normal in inches	Total since 1st January in inches	Division	Station	Total rainfall for the month in inches.	Departure from normal in inches	Total since 1st January in inches
Orissa & Circars	Gopalpur	3.9	-3.3	20.5	Central Contd.	Vellore	1.3	-3.3	7.3
	Calinga- patnam	4.6	-0.9	20.8		Gudiyatham*	3.3	-0.3	10.4
	Visakha- patnam	3.9	-0.5	13.6		Salem	8.4	+4.6	23.3
	Arakuvalley*	5.5	-4.0@	21.9		Coimbatore (A. M. O.)*	4.7	+2.6	19.2
	Anakapalle*	2.8	-3.7	11.3		Coimbatore	3.6	+1.9	18.4
	Samalkot*	7.1	+1.3	15.5	South	Tiruchirap- palli	4.2	+3.1	13.8
	Kakinada	8.1	+1.5	14.7		Naga- pattinam	0.6	-1.1	9.0
	Maruteru*	9.6	+0.2	16.2		Aduturai*	1.2	-0.9	7.1
	Masuli- patnam	7.8	+1.4	12.2		Pattukottai*	3.7	-0.3	11.0
	Guntur*	6.3	-0.4	10.7		Mathurai	2.9	+0.9	17.5
	Agrl. College, Bapatla*	2.0	-4.0	6.0		Pamban	0.9	+0.4	5.6
	Agrl. College, Farm, Bapatla*	4.3	X	8.9		Koilkatti*	1.1	+0.4	8.5
	Renta- chintala	5.4	+0.6	10.8		Palayam- cottai	1.0	+0.7	9.9
						Amba- samudram*	3.4	+2.7	14.1
Ceded Districts	Kurnool	7.1	+2.7	9.3	West Coast	Trivandrum	21.9	+14.1	39.7
	Nandyal*	3.1	-3.1	9.8		Fort Cochin	42.1	+18.8	70.8
	Hagari*	4.5	+3.0	7.5		Kozhikode	47.3	+13.0	71.4
	Siruguppa*	4.6	+1.3	11.0		Pattambi*	37.2	+12.5	53.7
	Bellary	8.6	+7.0	11.7		Taliparamba*	59.1	+15.4	75.8
	Cuddapah	6.4	+2.3	7.2		Wynaad*	32.1	+9.3	56.2
	Kodur*	3.6	-0.8	6.1		Nileshwar*	70.9	+27.5	89.5
	Anantapur	5.0	+2.4	9.1		Pillicode*	62.7	+21.0	82.1
Carnatic	Nellore	3.0	+0.2	3.9	Mysore & Coorg	Mangalore	64.5	+25.1	83.0
	Buchireddi- palem*	3.9	+1.3	5.0		Kankanady*	68.0	+27.0	88.0
	Madras (Meenam- bakkam)	2.2	-1.4	4.4		Chitaldrug	3.5	+0.6	7.9
	Tirur- kuppam*	2.9	-1.8	5.4		Bangalore	7.0	+3.1	17.8
	Palur*	1.5	-1.9	8.2	Hills	Mysore	4.6	+1.9	16.1
	Tindivanam*	4.2	+1.1	9.0		Mercara	60.0	+16.9	83.1
	Cuddalore	1.3	-1.3	7.8		Kodaikanal	16.2	+11.5	34.9
						Coonoor*	6.2	+3.1	34.9
Central	Arogyavaram (Chittoor dt.)	4.3	+1.9	8.7		Ootacamund*	9.4	+2.9	32.6
						Nanjanad*	13.0	+2.0	40.1

- Note:—**
- * Meteorological Stations of the Madras Agricultural Department.
 - @ Average of eight years data for Arakuvalley is given as normal.
 - Average of ten years' data is taken as normal.
 - X The Farm was started only in 1951.
 - Errata:** The total since 1-1-1953 to 30-6-1953 for Rentachintala is only 5.4 inches, the rainfall for the month of June being 4.2 inches.

Weather Review for July 1953

During the commencement of the month an extended trough of low existed over Chota Nagpur and the adjoining Gangetic West Bengal and neighbourhood. This weak surface low with its associated cyclonic circulation extending upto about 5,000' above sea level persisted in the same place upto 5-7-1953. This started moving westwards on 6-7-1953, passed over North-east Madhya Pradesh North Madhya Bharat and neighbourhood and merged with the seasonal trough on 8-7-1953. The monsoon had been fairly active along the West coast on the first two days of the month and then became vigorous. It maintained its vigour upto 7-7-1953 and then slightly weakened over Malabar and South Kanara. During this period wide spread heavy to very heavy falls occurred over Malabar, South Kanara and Coorg.

All the rivers in Mysore and Tamilnad were in spate and the reservoirs got filled up quickly. There was an unprecedented inflow of water into the Mettur reservoir at the rate of 2,23,000 cusecs on July 9th. The level of water which was about 40 feet on June 29th rose to 112 feet on July 12th.

After 8-7-1953 the activity of the monsoon shifted to Konkan, central parts of India and North India. A cyclonic circulation extending upto 3,000' above sea level appeared over Gangetic West Bengal and neighbourhood on 13-7-1953. This moved towards North west and got filled up over south west Uttar Pradesh on 15-7-1953. A weak cyclonic circulation lay over the Punjab (I) on 16-7-1953 and became unimportant on the following day. On the eve of the same day another cyclonic circulation lay over Saurashtra and Kutch, which moved towards north west on the next day. The axis of the monsoon trough moved towards north on 16-7-1953. The monsoon was generally weak along the West Coast. Two cyclonic circulations existed on 18-7-1953, one over the Gangetic West Bengal and the other over the south west Uttar Pradesh. Both moved towards west and became unimportant in two days. The monsoon weakened over the whole country outside the Punjab (I) and Madhya Bharat on 20-7-1953. The monsoon was fairly active over the South Peninsula on 21-7-1953. The axis of the monsoon trough lay close to the foot of the Himalayas on 22-7-1953.

A weak surface low existed over east Uttar Pradesh on 22-7-1953 and another over Hyderabad on 23-7-1953. Conditions were unsettled in the West central Bay of Bengal on 24-7-1953 but they became less marked on the very next day. A low pressure wave which lay off Malabar-South Kanara coast on 27-7-'53 became less marked on the following day. Unsettled conditions prevailed in the West central and the adjoining North Bay of Bengal from 29-7-1953 to the end of the month. The monsoon strengthened along the west coast on 29-7-1953 and maintained its vigour upto the end of the month.

The noteworthy rainfalls for the month and the zonal rainfall are furnished here under :

Noteworthy falls for the month

S. No.	Name of place	Date	Rain fall for past 24 hours
1.	Shimoga	2-7-1953	4.4"
2.	Kankanadi (Mangalore)	3-7-1953	6.3"
3.	Nileshwar	"	6.26"
4.	Pilicode	"	6.20"

S. No.	Name of place	Date	Rain fall for past 24 hour
5.	Alleppey	5—7—1953	5·0"
6.	Mercara	6—7—1953	9·2"
7.	Wynaad	do.	7·25"
8.	Kozhikode	7—7—1953	7·5"
9.	Badagara	do.	8·58"
10.	Irinjalakuda	do.	6·00"
11.	Ponnani	do.	5·92"
12.	Pattambi	do.	5·36"
13.	Bellary	25—7—1953	4·0"

Zonal Rainfall

S. No.	Name of zone	Rainfall for the month in inches	Departure from normal in inches	Remarks
1.	Orissa and Circars	5·48"	— 0·91"	Just below normal
2.	Ceded Districts	5·36"	+ 1·85"	Above normal
3.	Carnatic	2·71"	— 0·54"	Just below normal
4.	Central	3·80"	+ 1·18"	Above normal
5.	South	2·03"	+ 0·56"	Just above normal
6.	West Coast	50·58"	+ 18·37"	Far above normal
7.	Mysore and Coorg	18·78"	+ 5·63"	do.
8.	Hills	11·20"	+ 4·88"	do.

Agricultural Meteorology
Section,
Coimbatore

A. S., C. B. M. and M. V. J.

Departmental Notification

GAZETTED SERVICE
Postings and Transfers

Name	From	To
Annamalai, C.	Movement Officer Civil Supplies, Visakapatnam	Spl. D. A. O. Crop Sampling, Madras.
Krishna Marar, M. M.	Agronomist Central Coconut Research Station Kasargode	Asst. Oil Seed Specialist Coimbatore
Ranganathaswami, G.		D. A. O. Anakapalle
Rama Rao, V.	Spl. D. A. O. Crop Sampling	Spl. Dy. D. A. Crop Sampling Madras

Name	From	To
Radhakrishnan, T.	Asst. Agrl. Engineer, Bapatla	Lecturer in Civil Engi- neering, Agrl. College Bapatla
Ramachandra Rao	Supdt. A. R. S. Hagari	Supdt. A. R. S. Samalkota
Subramaniam, R. S.	Lecturer in Mech. Eng. Agrl. College, Bapatla	Asst. Agrl. Engineer, Madurai
Srinivasan, V.	Asst. in Pulses, Coimbatore	Chillies Specialist, Lam. Guntur
Suryanaraynamurthy, B.	Asst. in Pulses	Supdt. A. R. S. Hagari
Venkatachalam, Ch.	Junior Lecturer in Agriculture, Bapatla	Spl. D. A. O. Crop Samp- ling Vijayawada
Venkatakrishnan, G.		D. A. O. Guntur
Venkataaraman, A.	A. D. Palani	D. A. O. Under training

Upper Subordinate Service

Name	From	To
Adivi Reddy, A.	A. D. Chandragiri	S. D. Asst. Cuddapah
Ayyaswami, K.	Trainee in Horticulture Coimbatore	A. D. Kodavasal
Balasubramaniam, K. R.	S. D. Asst. Salem	A. A. D. Rasipuram
Balasubramaniam, P.	Trainee in Horticulture Coimbatore	A. A. D. Kodumuru
Chandra Mohan, J.	Asst. in Paddy Coimbatore	Asst. in Paddy, A. R. S. Ambasamudram
Damodharan Nambiar	A. D. Badagara	A. A. D. Kalpatta
Govinda Iyer, T. A.	Asst. in Chemistry	Statistical Asst. Tanjore
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Krishnamaraju	F. M. Sugarcane Station. Hospet	A. A. D. Hiramandalam
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Mohd. Abdul Khalak		A. D. Rajampet
Dr. Mariakulandai, A.	Asst. in Chemistry	Asst. in Chemistry, (Main Section) Coimbatore
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Natarajan, L. R.	Asst. in Entomology, Coimbatore	Asst. in Ento. Aduthurai
Narayanan, N.	A. D. Chingleput	Marketing Asst. Madras
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Padmanabhan Nambiar	A. D. Calicut	A. D. Tellichery
Ramanathan, G.	Spl. A. D. Mewani	Spl. A. D. Manures, Tiruvarur
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Ramadass, R.	Do. Do.	A. A. D. Chidambaram
Ramaswami, K. R.	Do. Do.	Asst. in Paddy, Coimbatore
Ramakrishnan, S.	Do. Do.	Fruit Asst. Coimbatore
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